THE ROLE AND FUNCTION OF "TOKENS" AND SEALING PRACTICES IN THE NEOLITHIC OF THE NEAR EAST:

THE QUESTION OF EARLY RECORDING SYSTEMS, SYMBOLIC STORAGE, PRECURSORS TO WRITING, GAMING, OR MONITORING DEVICES IN THE WORLD'S FIRST VILLAGES.

VOLUME ONE

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ABSTRACT

The Neolithic in the Near East was a crucial transitional period, evidencing the appearance of the world's first permanent farming villages, alongside significant changes in social structure, subsistence and artistic expression. This thesis focuses on an enigmatic artefact type; small, geometric clay objects, or "tokens". "Tokens" appear in the 10th millennium BC, and by the late Neolithic they are present in abundance at large numbers of sites across the region, yet absent at others. The timing of the appearance of "tokens" is significant; however, until recently, the potential importance of these objects was often unrecognised. Schmandt-Besserat's research (1992a, 1992b, 1996) represents the only comprehensive study on the subject. She claims "tokens" are mnemonic recording devices, appearing to meet the administrative needs of the first sedentary farming communities, eventually developing into the world's earliest known written script. Though her interpretation is widely accepted, her evidence hails entirely from sites distant in space and time from where these objects initially appeared, and there is no solid evidence supporting the notion that Neolithic "tokens" formed a unified agricultural administrative framework.

This thesis considers the classification, form and function of "tokens", as well as their temporal and spatial distribution across sites, their find contexts and the relationship between them, sealings and stamp seals. It re-evaluates the validity of Schmandt-Besserat's theory alongside alternative interpretations, including children's toys, gaming pieces, administrative counting aids, and more complex accounting tools. Almost 3,000 "tokens" from three well documented case-study sites (Boncuklu Höyük, Çatalhöyük, Tell Sabi Abyad) and twenty less complete assemblages were studied in detail, recording their shape, dimensions, manufacture, use-wear, the find contexts, associated objects and the characteristics of the sites where they are found. This was complimented by a broader level survey charting the presence, number or absence of "tokens" at fifty-six additional sites.

This study has shown that there is no correlation between "token" distribution according to region, time period, site size, or on-site activities. The range of shapes, degree of standardization and assemblage composition varies greatly from site to site, with little regional, temporal or other correlation. Variability is also evidenced in the nature of sites yielding "tokens", and the immediate contexts in which they are found (e.g. refuse contexts, domestic contexts, administrative contexts, possible ritual contexts). Their generally large numbers when present, variability of deposition, high proportion found in disposal contexts, their simple shape and often crude appearance proves "tokens" were quickly and easily made, and disposed of as readily. All evidence supports the interpretation of "tokens" as multi-functional artefacts, fulfilling a variety of uses within and across settlements. Though sometimes used in accounting, they were not created to administer agricultural produce and were not part of a unified symbolic system. As objects they operated with fluidity of function and interpretation, with imbued value and meaning.

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CHAPTER 1: INTRODUCTION

This thesis seeks to investigate the function of a little studied and little understood group of artefacts: small geometric clay objects, or "tokens" as they are commonly known (figure 2.2). These objects will be referred to as "clay objects" throughout this thesis (other artefacts will be referred to by their common name: stamp seal, figurine etc.). The appearance of clay objects in the archaeological record of the Neolithic period in the Near East coincides with the onset and development of fundamental economic, social, and technological innovations including most importantly, the emergence of the world's first sedentary agricultural villages. Initially appearing at a small number of sites in Anatolia, Upper Mesopotamia, the Zagros and the Levant, numerous examples of sites with clay objects can be found from the Early Neolithic period, from the mid-to late 10th millennium calibrated BC (henceforth "cal. BC", see map figure 4.1, Chapter 4). By the Late Neolithic (7th and 6th millennium cal. BC), clay objects are present in abundance at a large number of sites, being particularly characteristic of Halaf sites, yet continue to remain absent at others.

1.1-RESEARCH CONTEXT & RELEVANCE

Despite the significant timing of their appearance, the simple and often crude form of Neolithic clay objects has led to their frequent exclusion from any in-depth study. Until very recently, clay objects were commonly dismissed when recovered at prehistoric archaeological sites. Increasingly, excavators are recognising the possible importance of these objects, including them in publications (e.g. Çilingiroğlu *et al.* 2004: 48-9, 125, figs. 31.6 to 31.17; Duru & Umurtak 2005: 109-10, 174, 197, pls. 130, 131, 171). However, corresponding independent analysis of their finds, particularly their context and role within the community is generally still lacking. Therefore, despite the great research and interest in the Neolithic period of the Near East, little is known of the function of clay objects; they remain an enigmatic feature of many Neolithic sites in the region.

The significance of small geometric clay objects to the world's first settled farming communities is suggested by their enduring nature; they remain a common feature of towns and villages in the Near East for many thousands of years, into the 1st millennium cal. BC. Their function in the urban settlements of the mid to late 4th millennium cal. BC onwards is undisputed. It is at this precise point in time that cuneiform, the world's earliest known written script, began to be developed in two urban centres of the Near East, Uruk in south Mesopotamia and Susa in Elam. In both

centres, it was rendered by a series of intricate wedge-shaped markings onto tablet-shaped pieces of clay. Proto-cuneiform (originating in Uruk) developed into full written script, whilst proto-Elamite (developed in Susa) was discontinued. The earliest texts comprise administrative accounts, such as lists of cereals and animals as agricultural commodities. From the mid to late 4th millennium BC, it is clear that clay objects were part of a complex administration system. They were used in south Mesopotamia and Elam alongside seals, sealings, hollow spherical clay envelopes or "bullae" (figures 2.1 and 2.6) and early administrative texts (in the form of numerical tablets, proto-cuneiform tablets, proto-Elamite tablets and full cuneiform written texts).

Small clay objects are generally agreed to have operated as part of a complex mnemonic recording system from the mid-4th millennium BC, with their shape, along with their size and decorative elaboration symbolically identifying them as representing a set unit of a specific commodity, perhaps even universally recognised across a wide geographical area (Leo Oppenheim 1959; Nissen *et al.* 1993: pp. 11-13, fig 113 p. 130 and chronological chart figure 3 p. 5; Robinson 2007: 60-61, 62-62; Sampson 1985: 57-61; Schmandt-Besserat 1992a: 7, 108-110, 129-130; Schmandt-Besserat 1996: 7, 102). However, scholars focusing on the origins of cuneiform script and administration in the Near East's early state societies admit that exactly how this system operated, the symbolic value of clay objects, and the relationship between seals, sealings, "tokens", bullae and early administrative texts is still not fully understood.

The recording of number alone was extremely complex in both the earliest archaic texts and full cuneiform script. With different numerical systems used simultaneously to record different things, the earliest use of abstract number as a concept, is not seen in written form until over one thousand years after the advent of writing, at the end of the 3rd millennium BC (Ur III period) in South Mesopotamia (Nissen *et al.* 1993: 125-30, 134-38, 142-51). Due to a lack of research into the form, context and function of the earliest clay objects, when found at Neolithic sites, they are often attributed with the same administrative function as their 4th millennium, Sumerian counterparts. This is done with little regard to the vast expanse in geography, time, lifestyle and settlement structure, which separates sites with assemblages of clay objects from the Neolithic period, from those of South Mesopotamia late 4th to 1st millennium cal. BC. Geometric clay objects have been catalogued as ''counters", "geometrics", "figurines", "gaming pieces", "tallies" and "misc. items" in addition to their interpretation as recording devices usually with no justification.

Aside from the obvious importance of clay objects to the development of a highly efficient bureaucratic system in the 4th millennium perhaps including the development of writing, their potential significance within Neolithic society 6,000 years earlier and the story of human development as a whole cannot be denied. The changes which took place during the Neolithic period in the Near East truly were ground-breaking. The emergence of agriculture and permanent settled communities in villages fundamentally changed the way people lived, interpreted and interacted with the environment, nature and with each other (as detailed in Chapter 3). If, as widely assumed, clay objects were used within the sphere of accounting, their presence signifies a dramatic change in the negotiation of the management and allocation of resources, ownership and record keeping. They may hold the key in addressing the salient question to human history- how did recording and information storage develop? What sparked it?

To date, no solid or direct evidence supporting or refuting the use of Neolithic clay objects as administrative accounting tools, operating as symbolic recording and information storage devices, has been advanced. Geometric clay objects may have merely operated as simple counting tools used in one-to-one counting tasks rather than for complex calculations or long-term information storage and transmission. They could have been used to tally the precise number of animals, units of produce or other articles directly: a one-to-one relationship against the number of clay objects. A simple example would be a shepherd and his flock: counting out individual animals from the pen by the shepherd who will take them for grazing. Each animal would be counted individual against individual clay objects to create a pile of bag of clay objects. The animals could be counted back into the pen at the end of the day, against the removal of individual clay objects, one for each sheep. If a surplus of clay objects occurred, sheep were missing. This becomes a simple but effective method with which to count and account for livestock in a form of short-term information storage. Clay objects may have also been decision making aids, being used in the casting or drawing of lots, as part of divination, or merely to make a fair selection (and thus avoid possible confrontation) related to the rationing of resources, for example land, meat or grain. There are multiple possibilities of use outside the sphere of administration and organisation that need to be considered, including the functioning of clay objects as gaming pieces or counters, the use of clay objects as weights, decorative inserts placed on, or into, floor and wall surfaces (as seen in 3rd millennium Mesopotamia) or as decoration in the form of pendants worn on the body or sewn onto clothing.

1.2-AIMS & OBJECTIVES

This thesis offers a complete re-evaluation of previous evidence in relation to Neolithic clay objects in order to address the unanswered questions regarding their initial emergence and use. It re-evaluates the validity of Schmandt-Besserat's (1996, 1992a, 1992b) theory (see Chapter 2) alongside alternative interpretations. Schmandt-Besserat argues that clay objects are "tokens"; used initially in the Neolithic to count, and later in the Neolithic period and beyond for long-term information storage, in the administration of agricultural produce and other commodities including finished goods (1996, 1992a, 1992b). The "token" system, she claims, became increasingly complex over time, with specific shapes and sizes representing specific goods-as part of a Near Eastern-wide system. Schmandt-Besserat claims that clay objects had a single and uniform function across the entire Near East; and over many millennia from their initial appearance into the literate periods. Created for administration, she interprets Neolithic "tokens" as the first step towards the development of writing; seamlessly developing into cuneiform script.

AIMS

The aims of this thesis are firstly to define small geometric clay objects or clay objects as an artefact category. Secondly, to provide a detailed study of the many varied object attributes related to the appearance, manufacture and composition (including shape, size, material, colour and manufacture techniques) of individual clay objects. Thirdly, entire assemblages of clay objects from a number of different sites will be studied in order to establish the degree of similarity of objects within, and across, different assemblages, identifying groups capable of being used to conveying the same symbolic meaning. Lastly the nature of sites with and without the presence of clay objects will be compared, in order to see whether or not there is any correlation in the nature of a site and the range of on-site activities and the presence of assemblages of clay objects.

-Form

The examination of clay object form seeks to investigate whether or not there is a set repertoire of clay objects in circulation in the Neolithic Near East by assessing how similar in appearance entire assemblages of clay objects are, across different sites. The range and proportion of objects according to size, shape and other variables (including skill of craft, clay colour and decorative elaboration) will be studied and compared in order to determine the most common shapes, how uniform assemblages of different sites are, and whether this changes through time or regionally. This analysis will address questions such as whether or not the range and combination of clay objects

found at each site becomes more standardised over the course of the Neolithic? Did the range of clay object type increase or decrease during the Neolithic Period? Were clay objects part of a set symbolic system, operating across the entire Neolithic Near East, specific regions or time periods or within certain inter-site networks?

-Function

Study of the wider meaning and function of clay objects seeks to investigate where on-site clay objects were used, and by whom. Are clay objects common inside buildings, or only in certain buildings or areas of a site? Is this patterning consistent or does it vary across sites, time periods or regions? Is there any evidence to support the notion that clay objects were created to fulfil the administrative needs of early farmers? Were clay objects an integral component of village life in the Neolithic Near East, and if so, how is the apparent (of true) absence of clay objects some sites explained? The meaning encoded in the appearance of clay objects will be investigated, along with contextual data to consider their meaning, and whether or not clay objects had a single and universal function and meaning in the Neolithic (at any point in time, or for the duration of the time period)? It is possible that the function and meaning of clay objects transient, with objects used to perform multiple functions or hold multiple meanings within a single site, across sites, regionally or temporally. Their value may have been integral, yet could have been imbued.

-Distribution

Looking at the research question more broadly, a survey of Neolithic Near Eastern sites, their basic characteristics, excavation strategy and recovery techniques amongst other factors will be carried out in order to discern if clay objects really were absent at some sites, or if this absence is due to external factors such as the lack of publication, lack of thorough excavation (including limited or no use of flotation and sieving), or classification difficulties. Differences in the distribution and number of Near Eastern Neolithic sites with clay objects; either regionally or temporally will be sought, as well as differentiation between sites with and without clay objects according to factors including site location, environment, subsistence strategies, site size, and the type and range of on-site activities.

THE SITES & EVIDENCE

Three case-study sites form the basis of this thesis: Boncuklu Höyük and Çatalhöyük in Central Anatolia, alongside Tell Sabi Abyad in Northern Syria. All were selected due to

their large token assemblages and well-documented excavation contexts, allowing not only the geometric clay objects themselves, but also details related to their context, object associations and object location, within the sites to be examined. Objects were studied individually, in order to assess not only the type and range of objects present at each site (in terms of size, shape, craft and other aspects of appearance), but to enable the study of the character of entire assemblages of clay objects to be assessed. This allowed the determination of the degree of diversity or similarity of clay objects present within a single site to be made, and compared with assemblages of clay objects from other sites (within different regions and time periods of the Neolithic Near East). This information was then used to determine the degree of standardisation of clay object assemblages across the Neolithic Near East and to assess if clay objects were part of a shared symbolic system. The case-study sites are grouped under the category of tier 1 sites. Tier 2 data comprises the individual study of incomplete token assemblages from museum collections and publications, totalling twenty sites covering all geographic regions and time periods within the Neolithic Near East. The third tier of recording identifies additional sites where clay objects have been recovered, although not published in enough detail to enable the study of individual objects.

For all sites, the collections of small geometric clay objects were not studied in isolation. In order to test the hypothesis that they functioned alongside seals and sealings as part of the administration of agricultural goods, features related not only to the context of individual clay objects (where possible) within each site, but also the type of sites they came from were noted, and contrasted alongside estimates of the total number of clay objects present at each site. This enabled a consideration of issues such as the location of on-site use and disposal, possible associated exchange goods, the use of craft items, and temporal and regional trends, providing a far better understanding of token use than a study of their form and number alone. Whether certain sites display a real absence of clay objects or whether this is due to issues of retrieval and publication also will be assessed. If the objects are tokens, understanding the development of early recording systems from their initial appearance will provide vital insights into the nature of the emergence of writing and associated social technologies, which are important features in the development of social complexity.

1.3-STRUCTURE

This thesis is divided into eleven chapters, including the introduction and conclusion. The first section-Chapter 2, considers previous interpretations of small, geometric clay

objects. The main aim is to assess the range and plausibility of functional interpretations of clay objects in the Neolithic Near East. This chapter contains a detailed literature review of the main discussions of geometric clay objects in the study region and time period, followed by an analysis of interpretations of similar objects in the Near East of the 4th to 1st millennium BC. A survey of archaeological evidence from other regions and time periods considers how similar objects are utilised by different societies. Likewise, the study of recording devices in history and ethnography, from diverse regions and time periods, investigates the various forms in which non written information storage can exist and operate. Chapter 2 also presents an in-depth analysis of the common themes and interpretative theories of the function of small geometric objects that emerge in the literature review. It assesses the plausibility of these main theories, especially in relation to exactly how clay objects might have operated in these scenarios in the agricultural villages of the Neolithic Near East and addresses research questions related to meaning and function.

Section two (Chapters 3 and 4) provides an introduction to the region, time period and sites in question. It provides the basis for the investigation of research questions related to the distribution and function of clay objects. Chapter 3 is a broad survey of the location, climate, environment, subsistence strategies and chronology of the Neolithic Near East. Throughout this thesis, reference to dates is preferred in years calibrated BC, in millennia, or parts thereof. Cultural periods of the Neolithic are detailed in Chapter 3, however, these can be debated in terms of exact start and end dates duration, correlation across regions, the actual terms used and the characteristics used to define each. Therefore the use of dates or millennia is clearer, and less open to interpretation. Following on from chronology, regional differences across the Neolithic of the Near East are outlined within Chapter 3. Lastly specific aspects of Neolithic culture, architecture, storage, the advent of pottery, economic practices, social structure and ritual, will be introduced. By outlining the nature of Neolithic communities in the Near East, including regional and temporal trends, the various interpretative possibilities of clay object, as they may have operated in the various spheres discussed in Chapter 2 can be addressed, as well as questions related to their distribution according to site type, as well as temporal and regional differences. Chapter 4 is divided into three sections and presents a background of each of the three case-study sites: Boncuklu Höyük, Çatalhöyük and Tell Sabi Abyad. Again this detailed examination of the case-study sites allows their assemblage of clay objects to be interpreted in their full context; providing a clear idea of the spheres and activities in

which clay objects might have been useful in, and utilised within therefore. It also highlights the similarities and differences across the case-study sites-thus allowing the degree of diversity to be considered alongside differences in the nature of each site's clay object assemblage.

Section three covers the objects themselves. Chapter 5 details the methodology of this thesis; addressing exactly how the research questions will be investigated. This leads into the analysis section. Chapters 6, 7 and 8 each present detailed analysis of the large corpus of clay objects studied at each case-study site, along with the context of individual clay objects. These chapters, along with Chapter 9 address questions related to object form and context. Data from the twenty tier 2 sites is presented in Chapter 9. The last section of the thesis-Chapter 10 compares the data of the case-study sites with one another, incorporating comparative analysis of the tier 2 and 3 sites. The main functional interpretations of small geometric clay objects in the Neolithic Near East are assessed in light of the evidence presented (clay object form and the sites they come from), followed by the Conclusion (Chapter 11).

A number of appendices, labelled A to J, accompany this thesis. The bulk of the morphological object data collected, tiers 1 and 2, is presented electronically in Appendix A (Access database). A separate electronic database recording contextual information for Tell Sabi Abyad's clay objects is Appendix G. Broader information related to the nature and character of sites with and without clay objects is recorded in Appendix J (electronic. Excel format). This includes the approximate number of clay objects at each site, along with their size, region, period of occupation, subsistence strategies and excavation techniques. Additional illustrations, charts and tables resulting from the extensive analysis of geometric clay objects and their immediate context is presented site by site for each of the case-studies in Appendices B, C and F (Boncuklu Höyük, Çatalhöyük and Tell Sabi Abyad respectively). Çatalhöyük's analysis chapter (Chapter 7) is also supplemented by Appendix D, a study of zoomorphic figurines, stone balls and other spheres from the site, which were studied in addition to the site's main clay object assemblage. As circumstances necessitated a slightly different approach to the study of material from Tell Sabi Abyad, a supplementary appendix to the methodology is detailed in Appendix F. Additional illustrative data from the tier 2 sites forms Appendix H and the cross-site analysis of Chapter 10 is illustrated (in addition to within the chapter) in Appendix I.

CHAPTER 2: REVIEW

2.1-INTRODUCTION

This chapter seeks to review the main treatments and interpretations of the enigmatic, small and mostly geometric shaped clay objects ("tokens") characteristic of Near Eastern settlements from roughly the 9th to the 1st millennium BC. Varied interpretations of the role and function of clay objects have been proposed, including a dismissal of the objects as an artefact category altogether. As will be demonstrated, almost all academic discussion regarding the function of clay objects in the Near East revolves around their supposed use within the administrative sphere. Despite this apparent consensus, the exact ways in which clay objects might have been utilised in counting and recording is debated. Some scholars argue clay objects were used in a very specific manner and uniform way across the entire Near East, over many millennia, whilst others disagree with the nuances and detail of the predominant argument.

The focus of this thesis is the function of clay objects in the context of the Neolithic period, the earliest instance in which they appear. However, the domination of the counting and storage of information interpretation has led to the focus of almost all scholarly research and debate regarding the function of geometric clay objects to centre on the mid to late 4th and early 3rd millennium BC. This, the early historic period saw the appearance of the earliest written script. Developed in the first state societies of Mesopotamia and Elam, the writing appears to have been invented to administer food produce and other goods. The focus on the interpretation and investigation of the function of clay objects as accounting tools, and on the period of the earliest known written records in the Near East, has resulted in a neglect of the study of Neolithic clay objects.

In order to thoroughly review previous interpretations of geometric clay objects in the Near East, this chapter has a significant focus on the early historic period late 4th and 3rd millennium BC), reflecting the temporal bias of scholarly research. In addition to the Near East region, archaeological, alongside ethnographic and ethno-historical sources will be reviewed, examining comparative small geometric objects from diverse time periods, regions and cultures. Ancient Greece and Rome, Dynastic Egypt, Prehistoric and Medieval Europe, as well as prehistoric and historic Africa are studied alongside items from the ancient Near East, from the Neolithic period onwards. Likewise, prehistoric and non-literate accounting, recording and information storage systems

from a diverse range of societies, world regions and time periods are reviewed. This comparison enables Neolithic clay objects to be studied in a broad perspective. It also draws parallels between the form and use of information storage tools from different regions and time periods; as well as the methods, techniques, capacity and function of non-literate counting and recording systems.

2.2-SUBJECT OVERVIEW

The presence of large numbers of small geometric clay objects at many Neolithic Near Eastern sites has long been acknowledged, yet they are often overlooked in excavations, being left unrecorded or unpublished in final site reports. It was not until clay bullae, hollow spherical clay envelopes, marked with impressions on the outside and containing small clay objects, were first excavated at Near Eastern sites of the late 4th to 2nd millennium BC (figure 2.1) that attention focused for the first time on the small clay objects themselves, although many were still discarded on site, overlooked in favour of more elaborate artefacts of a clear and distinct function (for example Leo Oppenheim 1959: 124). Few interpretations of the *Neolithic* clay objects (figure 2.2) have been proposed and thoroughly investigated. Tentative attempts at interpretation are often made in the basic classification of the objects in site reports (as reflected in the title of the chapter or appendix of the section of the publication in which they appear), yet few of these explain their assignment of a particular role, or offer supporting evidence such as contextual information. Their incongruous function has often led to the decision to exclude the publication of Neolithic clay objects altogether.

Denise Schmandt-Besserat is currently the most prominent academic in the investigation of the function of Near Eastern clay objects. Since the late 1970's, she has advanced a detailed set of theories as to the reason for the initial appearance of geometric clay objects in the Neolithic (at that time thought to be in the 8th millennium BC) and the evolution of their form and function through time until their supposed decline with the advent of writing the in 3rd millennium BC (see below for detailed discussion of her thesis, and Schmandt-Besserat 1999a, 1999b, 1996, 1994, 1992a, 1992b, 1988, 1982a, 1982b, 1981, 1980, 1979, 1978a, 1978b, 1977a, 1977b, 1977c). She proposes the clay objects acted as counting tokens-utilised in the administration of agricultural and manufactured goods, with each type of clay object representing a set unit of a specific commodities-part of a "code" followed and understood across the entire Near East, one that remained constant for over 4,000 years. In addition to this claim, Schmandt-Besserat proposes the objects were the precursors of cuneiform

script, which current research suggests was first developed at the southern Mesopotamian site of Uruk (see map figure 4.1 for location) at the end of the 4th millennium BC. Though considering clay objects from their initial appearance in the Neolithic period, the focus of her work, and critics of it is the latter-proto and early historic period of the late 4th and early 3rd millennium cal. BC.

Aside from the theories presented by Schmandt-Besserat, few archaeological studies of the function of small geometric clay objects or "tokens" in the Near East have been undertaken. Clay objects of the prehistoric periods have been particularly neglected. Research has instead focused on investigating the evolution of writing, and the links between the use of bullae, sealings and archaic writing in the latter half of the 4th millennium BC onwards (i.e. Nissen *et. al.* 1993). Most scholars have been influenced by Schmandt-Besserat's ideas, with detailed, independent functional analyses of Near Eastern clay objects rare, those considering the Neolithic period, rarer still (i.e. Costello 2002, Lieberman 1980, Mattessich 1994, Netz 2002, Nilhamn 2002). The few independent studies that have been undertaken again focus on the early historic period, and tend to centre on the interpretation of the objects as gaming pieces, children's toys or simple accounting tools (as opposed to Schmandt-Besserat's complex theory) functioning purely as counting pieces in the administration of goods. Others still debate the existence of the clay objects as a serious artefact category, suggesting that at least the earlier, more unrefined examples are merely discarded pieces of refuse, the waste from the creation of real clay artefacts. The only group of academics to strongly contest Schmandt-Besserat's functional interpretation of clay objects is the early historic community; the so-called "Berlin Group" of academics. Represented by Hans Nissen, Peter Damerow and contemporaries, these scholars provide strong justification of their rebuke of Schmandt-Besserat's ideas. Yet on the role and function of the earliest, Neolithic clay objects, they propose no alternative argument due to their specialist focus (see section 2.4a ii below). From an alternative discipline, linguists examining the origins of written script tend to introduce "tokens" as the precursors of writing as a matter of course.

What many of the alternative interpretational studies have in common is the suggestion that the role and function of clay objects is not necessarily uniform at all sites across the entire Near East, and over the duration of their use (lasting over 6,000 years). Many also recognise that the classification of all small clay objects together is often arbitrary, carried out for the ease of recording in the field and publication, and

that differing functional uses of clay objects according to the various shapes and sizes they appear in is a strong possibility (Jasim & Oates 1986: 351-52; Kenyon & Holland 1982; Kenyon & Holland 1983; Lieberman 1980: 340-41; Leo Oppenheim 1959: 341; Voigt 1983: 95, 195; Voigt 2000: 256). Refreshingly, Christopher Woods of the University of Chicago's' Oriental Institute is currently working on a project, focusing on a better understanding of the exact use and meaning of clay objects and their relationship to writing. His work focuses on the study of the shape, size, range and distribution of clay objects (number, context-whether inside a sealed envelope or not, location on-site) at the crucial, transitional time period of the mid-to late 4th millennium BC, the "proto-literate" period which saw the development of cuneiform writing (Woods 2014; Woods 2010: 33-50).

2.3-PART ONE: MAIN INTERPRETATIONS OF CLAY OBJECTS IN THE NEAR EAST

Before outlining the main interpretations of clay objects, their definition needs to be explained. The term "clay object" is used in this thesis to describe the small objects most commonly known as "tokens", and also referred to in archaeological literature as "counters", "jetons", "gaming pieces" and the like. *Clay objects* are small (generally <5cm maximum dimension) and intentionally shaped into a geometric form (spherical, cube, cone etc.). Small or "miniature" vessels, and any miniature version of a naturalistic form (such as an animal or a bunch of wheat) are excluded from the category in this research. Clay objects can be plain or decorated with markings or incisions. Comparable objects of plaster are included. As are similar objects of intentionally shaped, naturally geometric shaped and/or incised stone, which are far rarer. The category excludes re-used pot sherds shaped into discs (see Chapter 5 for full criteria and clay objet definition).

The use of the term "token" is avoided in this thesis as it suggests a functional interpretation currently unsubstantiated for the Neolithic objects. Since the publication of Schmandt-Besserat's seminal work (1992a, 1992b), the term "token" has become synonymous with her and her ideas. Yet Schmandt-Besserat (1996, 1992a, 1992b) does not adequately detail which types of object are included and excluded in her use of the term. The problem of definitions and terminology in the study of archaeological finds is one highly relevant to the topic of small geometric clay objects (discussed in Chapter 5). Therefore an unbiased term, with a clear description of the object's parameters was

specifically sought in order to complete this study. The term "sealing" is also commonly used in this thesis (see Chapter 5.2 for a full definition and explanation). It is used to refer to the use of a piece of clay, in order to seal, close, keep closed or keep together a container, package, bundle, door or other receptacle. It may be plain or display the impression of a stamp or cylinder seal, in order to identify the piece of clay and prevent unauthorised opening (via breakage of the sealing). In the Neolithic context, a clay sealing is most commonly applied to the opening of a clay, stone or basketry container, in order to close it.

History of Study

The focus of this thesis is clay objects from the Neolithic of the Near East. This study has been necessitated by the fact that when recovered at Neolithic sites, clay objects have been paid little or no consideration until very recently. Practically all discussion of clay objects focuses on their presence and interpretation at sites of the early historic period in the south of the region that is from the mid-late 4th millennium cal. BC. Prehistoric examples have been largely ignored. It is only the potential of the functioning of clay objects within an administrative system, linked to the earliest writing in the Near East (which in turn was developed in order to meet the accounting needs of the early state societies of South Mesopotamia) that bought the existence of clay objects to the attention of scholars at all.

The earliest record of the publication of clay objects comes from the work of archaeologist J. de Morgan (de Morgan *et al.* 1905). It is a catalogue of artefacts which includes items labelled as "tokens" and "counters" and the hollow spherical envelopes they were often found inside. They come from a range of Middle Eastern sites of the "Early Periods". The first study of *Neolithic* clay objects concerned Jarmo's late Neolithic (6th millennium) artefacts, completed by Broman in 1958. However since then, it is the late 4th and 3rd millennium BC (proto-and early historic) clay objects and associated hollow envelopes (bullae) that have been the focus of interest. Research by Leo Oppenheim (1959) and Amiet (1966) was crucial in linking clay objects to counting and administration, cementing the link between clay objects, bullae and sealing practices in the early historic Near East. This sparked a renewed research interest into early administrative technologies and their relationship to the appearance of writing. However the morphology, find context, site distribution and function of similar objects in the Neolithic period remained largely unstudied. As such, the following discussion of past interpretations of clay objects in the Near East relies heavily on work focused on

this latter, more intensively studied historic period, rather than the period of interest to this study, the Neolithic.

2.3(a)-SCHMANDT-BESSERAT'S ADMINISTRATION THEORY; COUNTING "TOKENS" & WRITING IN THE NEAR EAST

(i) Counting & Administration Tools in the Neolithic Near East

Denise Schmandt-Besserat first introduced her "token" theory in the 1970's (Schmandt-Besserat 1978a, Schmandt-Besserat 1978b, Schmandt-Besserat 1979), having spent time studying the earliest uses of clay in the Near East (Schmandt-Besserat 1974, Schmandt-Besserat 1977a, Schmandt-Besserat 1977b). This and further work culminated in the publication of a two volume book *Before Writing;* vol. i: *From Counting to Cuneiform* and vol. ii: *A Catalogue of Near Eastern Tokens* (1992a, 1992b). This was edited into a single volume entitled *How Writing Came About* (1996). She has since published numerous articles investigating the role of what she terms "tokens", defined as "small artefacts modelled in clay…used as counters to keep records of goods" (Schmandt-Besserat 1996: 184).

Schmandt-Besserat's theory stems from an extensive study of 10,000 clay objects, mostly previously unpublished material (7,000 of which are published in the catalogue, Schmandt-Besserat 1992a: 10). The artefacts are dominated by small, geometric clay objects, but also include a number of geometric shaped stone objects, as well as miniature vessels, anthropomorphic and zoomorphic figurines in clay (Schmandt-Besserat 1992a, Schmandt-Besserat 1992b, Schmandt-Besserat 1996). The material covers a long time period, from the mid-Neolithic c. 8,000 BC down to the start of the Early Bronze Age c. 3,000 BC. It hails from a large geographic area of the Near East incorporating a total of 116 sites covering the modern nations of Iran, Iraq, Syria, Turkey, Israel and Jordan (material from only 104 sites is published in the 1992 catalogue, Schmandt-Besserat 1992a: 7, Schmandt-Besserat 1992b: vii-viii).

Though stemming from the Neolithic period, the main discussions and interpretative sections of Schmandt-Besserat's theory of the use of clay objects as accounting tokens focus not on the Neolithic period, but on the later end of her time frame and the supposed transition of recording methodologies from the use of tokens into written script. Despite this, clay objects of Neolithic settlements are commonly labelled as counting or administrative "tokens" after Schmandt-Besserat's work. Groups of

divergent objects are often loosely classified together as such, yet with little explanation why. The excavation team of Neolithic Tell Sabi Abyad, Syria, is one of the few that have not only remarked on the presence of "tokens" at the site, but also valued them as an artefact category, developing theories related to their functional use and significance in the context of Neolithic villages (Akkermans & Verhoeven 1995: 8, 13, 14, 21-25, fig. 14 p. 24; Akkermans & Duistermaat 1996; Verhoeven 1999: pp. 203-32). However, their interpretation relies on Schmandt-Besserat's basic assumptions, and since these early attempts in the 1990's, nothing further has been published relating to the Sabi Abyad clay objects, with subsequent artefact based studies focusing their attention on sealings and early pottery of the site (see Akkermans & Duistermaat 2004 and Nieuwenhuyse, Akkermans & van der Plicht 2010 for example).

(ii) Schmandt-Besserat: Basic "Token" Argument

Schmandt-Besserat promotes various scenarios concerning the function of clay objects, based around their use as administrative tools, used to count and keep track of goods. Her theory proposes that Mesopotamian script, arguably the earliest writing in the world, developed from an archaic counting device, one which was comprised small clay objects (Schmandt-Besserat 1992a, Schmandt-Besserat 1996). She claims the objects acted as "tokens"; representing set units of specific commodities, and operating as a universal system of symbolic codes across the entire Near East, consistent from the 8th to the 4th millennium BC. The "token" system, she claims, becomes more complex during the 4th millennium, eventually evolving into the earliest symbols of writing, impressed into clay in the latter half of the fourth millennium BC (Schmandt-Besserat 1992a, Schmandt-Besserat 1996).

Schmandt-Besserat sites the work of Professor A. Leo Oppenheim (1959, see section 2.4a below), to support her argument, hailing the discovery of the main artefact of his article, a clay envelope or "bulla" containing "little stones" (since lost) and impressed on the outer surface with what appear to be clay objects as the "Rosetta stone of the token system" (Schmandt-Besserat 1996: 9). The appearance of clay objects in the Neolithic c. 8,000 BC is proposed as being tied into social and economic developments of the time, emerging to meet demands of the newly developed agricultural economy, and in the late urban period c. 4,000 BC onwards to keep track of goods manufactured in workshops in addition to agricultural produce. The objects, she claims, appear simultaneously with animal and plant domestication and food production, becoming more elaborate with the "rise of social structures" and "rank leadership", peaking in use

at the time of state formation c. 4,000 BC (Schmandt-Besserat 1992a: 99; Schmandt-Besserat 1996: 7). Thus she traces their development from "simple tokens" (figure 2.2) from 8,000 to 4,000 BC (appearing as simple geometric shapes characterised by a "remarkable continuity" across the entire regions for 4,000 years) to the "complex tokens" (figure 2.3) that apparently appear suddenly c. 4,000 BC (characterised by the introduction of a much wider range of shapes, many of which are decorated with incisions and markings unlike the earlier forms) (Schmandt-Besserat 1996: 16-17; Schmandt-Besserat 1992a: 36, 37, 49).

(iii) Developments in "Token" Use

From 4th millennium onwards, Schmandt-Besserat argues that an increase in bureaucracy led to new methods of organising, archiving, and storing the "complex tokens" (figure 2.3) that had previously been kept together in wooden boxes, cloth bags, baskets or leather pouches (1992a: 97). She claims the hollow clay envelopes or "bullae" that appear at this time were invented specifically to store clay objects, acting as a permanent archive (Schmandt-Besserat 1992a: 108; Schmandt-Besserat 1996: 7). Yet the drawback of this system, as interpreted by Schmandt-Besserat, was that the clay objects were hidden from view, and thus began the practice of impressing them onto the outside of bullae while still wet, with identical clay objects to the specimens sealed inside. (Schmandt-Besserat 1996: 7; Schmandt-Besserat 1992a: 109-114). It was soon realised that the clay objects need not be placed inside the bullae, as their impressions were clear on the outer surface of the envelopes. Therefore the use of clay objects changed, useful now for the two dimensional markings they made on the surface of wet clay (acting as a stamp), rather than as objects in their own right. Solid clay balls and soon flat clay tablets alone, displaying the impressions of, but devoid of actual clay objects, soon became the main method of administration in the Near East (Schmandt-Besserat 1996: 7; Schmandt-Besserat 1992a: 12-33).

(iv) Interpretation of Near Eastern Communities

Schmandt-Besserat charts a typological and functional development of clay objects from the 8th millennium BC onwards, stating that object form and use changed alongside developments in the society in which they were used (Schmandt-Besserat 1992a: 166-72, 198; Schmandt-Besserat 1996: 100). Clay objects, she suggests, do not appear in the archaeological record until the start of the 8th millennium BC once communities became sedentary, as hunter-gatherers had no need to count or record produce. Of hunter-gather societies, Schmandt-Besserat claims their "unlimited

resources", "reciprocal [exchange] relationships" and the absence of private ownership meant that they had no need to count or keep track of foodstuffs. The only use of "symbols" (defined as "things endowed with a special meaning, allowing use to conceive, express, and communicate ideas") within hunter-gather communities of the Palaeolithic Near East she claims, are tallies (see section 2.4c for discussion of tallies). Therefore, the many examples of Palaeolithic tallies, (defined as bone and stone artefacts marked with notches,) found in the Near East, as well as Europe and Africa were used, it is argued, purely to record time; movements of the moon (Schmandt-Besserat 1996: 100; Schmandt-Besserat 1992a: 157-59).

Agriculture, introduced as the next stage of human development, as practised by egalitarian, sedentary societies was what made accounting necessary c. 8,000 BC according to Schmandt-Besserat (1996: 102, 1992a: 161, 166-68, 170, 172). The recording system of the Neolithic, a system, made from clay, which it is claimed, was an entirely new medium (as opposed to the bone and stone artefacts of earlier times), created objects in specific shapes "for the unique purpose of communication and record keeping" related to agricultural produce (Schmandt-Besserat 1996: 102; Schmandt-Besserat 1992a: 161). From their inception, the shape of each clay object stood for a set commodity, working as a "fully fledged code" consistent across the entire Near East, from community to community, each representing "a precise quantity of a product" (Schmandt-Besserat 1996: 102; Schmandt-Besserat 1992a: 161-62, 198). In support of this interpretation, Schmandt-Besserat claims that at the start of the Neolithic, stamp seals also appear, forming an "administrative tandem" with clay objects, allowing for the recording of goods (clay objects) and the identification (via seals) of people responsible for them (Schmandt-Besserat 2007). They were used together for millennia (c. 6,500-3,500 BC) until their tandem use led to the "birth of writing" (Schmandt-Besserat 2007).

(v) Functional Use: counting & writing

The initial use of tallies, the later appearance of clay objects, and their apparent evolution into "complex tokens" and eventually writing is tied into the development of numeracy in the Near East according to Schmandt-Besserat. Counting developed, prompted by the practical needs of early communities in order to record agricultural produce (Schmandt-Besserat 1992a: 184-90; Schmandt-Besserat 1996: 103). Three systems of counting are proposed as represented by the three social developments:

- *tallies*-to record one-to-one correspondence only

- *"tokens"*-symbolising concrete counting
- *writing*-as evidence of the development of abstract counting

(Schmandt-Besserat 1996: 103; Schmandt-Besserat 1992a: 184-187).

Interlinked to this argument is the assertion that the use and evolution of clay objects over time, prove that "writing was the by-product of abstract counting" (Schmandt-Besserat 1992a: 199). Schmandt-Besserat claims clay objects were the direct precursors of the earliest written symbols. When the practice of impressing clay objects onto clay tablets was substituted for the incision of the shape that clay object impressions left in the clay, the resultant symbol represented the same unit of the same commodity as the clay objects it sought to replicate (figure 2.4) (Schmandt-Besserat 1996: 117). Thus the range of early incised symbols represented each of the many clay objects that had been in use in earlier times, each symbolically retaining the meaning of the three dimensional precursor; a set unit of a specific commodity (see Schmandt-Besserat 1996: 69-78; Schmandt-Besserat 1992a: 143-49 for the "code" of clay objects, associated pictographs and their proposed meanings) which developed quickly over the 4th and early 3rd millennium into a fully-fledged writing system (Schmandt-Besserat 1992a: 190-94; Schmandt-Besserat 1996: 117-122).

(vi) Evaluation

-Basic argument

At first glance, the argument presented by Schmandt-Besserat appears convincing, the logical result of a thorough investigation of the artefacts in question. However, there are many inconsistencies in her hypotheses, as well as statements that appear untenable and unsubstantiated. Much of the earliest evidence, including that of the Neolithic period is neglected, with the assertion that clay objects were identical at all Near Eastern sites over the entire 4,000 year prehistoric period covered (c. 8,000-4,000 BC). Thus the earliest clay objects catalogued by Schmandt-Besserat (1992b) are seen as hardly worthy of analysis and discussion. Thus the majority of Schmandt-Besserat's support for ideas is based on clay objects of the historic period, the "complex tokens" of c. 4,000 BC and later, the overwhelming majority of which come from two sites, Uruk and Susa (figure 4.1 for locations). Both sites are a considerable distance temporally and geographically from the first appearance of clay objects in the northern parts of the Near East in the Neolithic period. Schmandt-Besserat's entire premise is highly simplistic. The idea of a regional accounting system, originating in the Neolithic period, evolving into "complex token" system of the early historic period and the period

immediately before, is not supported by the evidence presented. Furthermore, the claim that these "complex" clay objects were the direct precursors of the earliest, proto-cuneiform symbols is not at all upheld by the study of the appearance and development of archaic cuneiform tablets (see for example Nissen *et al.* 1993: 11-15, 125-30).

-Evidence base

The catalogue presented by Schmandt-Besserat (1992b) is thorough, yet presents many difficulties when attempting to utilise the data in order to assess the arguments presented. Firstly, "tokens" are defined as small, geometric clay objects, yet stone items are also included, as are figurines, and non-geometric (pictographic and naturalistic items) with no real definition of what exactly constitutes a "token" in the project. As the objects are catalogued site by site rather than by date, and apparently in a random fashion within each site, it is difficult to assess the range of clay objects present in any one particular building, area, phase or occupational level of a site, or at a single site in general. It is also impossible to trace the supposed evolution of clay objects across time from plain to complex. If the objects did stand for the basic commodities of the community: wheat, beer, sheep and so on, then in the earliest mixed farming village communities, objects representing each of these commodities would be expected to be present, yet some sites appear to have restricted repertoires. The timing of the appearance of tokens, claimed as 8,000 BC, does not correspond to the start of the Neolithic (around 10,500 cal. BC, see table 3.1) as argued throughout Schmandt-Besserat's publications (for example 1992a, 1992b & 1996). However since the publication of her major works, clay objects have indeed been found at some of the earliest Neolithic sites. Yet stamp seals certainly are not evidenced at the start of the Neolithic, only appearing towards the end of the period in some areas (see Chapter 3). Thus the simultaneous appearance of clay objects and stamp seals with agriculture at the start of the Neolithic, a crucial aspect of Schmandt-Besserat's argument is not correct.

-Evolution of symbols

Schmandt-Besserat's interpretation of the evolution of symbols is highly simplistic. She claims "tokens" represented specific numbers-from the Neolithic period onwards. It is argued that a single, uniform number system was understood across the entire Near East, and existed into the later 4th millennium, when a linear symbolic progression between clay objects, their two dimensional impressions in clay and early numerical markings on clay tablets of pre-writing objects is seen. Although plausible at first

glance, a detailed examination the representation of numerals in both proto-cuneiform (the archaic script of Sumer) and contemporary proto-Elamite (used in Iran) shows just how complex writing and it's development was in the later 4th and early 3rd millennium. Rather than one universal numerical symbolic system, archaic texts utilised a multitude of numerical notation systems. Each was context specific, with a range of symbols used to represent specific numerical values according to what was being measured or accounted (see figure 2.5 top). The same symbol could therefore represent different values when recording wheat and sheep for example. Protoliterate number systems do not therefore, demonstrate the use of abstract number, a concept not evidenced until around 1,000 after the earliest, archaic texts appear in the region (Ur III period), as demonstrated in the abstract sexigesimal place value system (Brown 1996: 39; Damerow 1993: 29-31; Damerow 1988; Damerow & Englund 1987; Englund 1993: 1671; Friberg 1994: 482, diagram pp. 483-484; Michalowski 1993: 998; Nissen *at al.* 1993: 125-30, 140, 142-151; Woods 2010: 40-41). Schmandt-Besserat shows a total lack of understanding of this well-known fact of early Near Eastern writing, and presents no convincing evidence to support her claim that the earliest cuneiform symbols evolved from and represented the shapes of "tokens" in two dimensions (Damerow 1993, Englund 1998: 258, Friberg 1994: 482-86). Like numbers, the beginnings of the use of pictograms, incised into clay tablets, and their evolution into simple and then more schematically rendered symbols as part of the transition into fully fledged cuneiform script was equally complex. There is no evidence to support Schmandt-Besserat's notion that clay objects had set meanings for non-numerical words ("oil" or "wheat" for example), nor that their shape in three or two dimensions was replicated by the earliest written symbols in clay (see Nissen *et al.* 1993: pp. 19-35 & Woods 2010: pp. 33-84 for example).

-Context

Contextual information related to the immediate location of clay objects within settlements, Neolithic or otherwise, object associations, and wider contextual information (site occupational phase for example) are lacking for most sites discussed by Schmandt-Besserat, though this is largely due to the lack of recording of such details in site reports rather than an omission of data by Schmandt-Besserat (Schmandt-Besserat 1992a: 93, 1992). The context of clay objects is particularly important as Schmandt-Besserat claims that from their earliest appearance in the farming villages of the Neolithic Near East, clay objects were used as administrative tools, to count and record agricultural produce. This was their sole function from the start, a function

which remained constant, expanding to the administration of all types of commodities from the late 4th millennium BC (Uruk period) onwards. If so, then we would expect clay objects to be found almost exclusively in an administrative setting. As Schmandt-Besserat does not discuss the context of the majority of clay objects from any of the 104 sites from which objects are catalogued (Schmandt-Besserat 1992b), it is impossible to make an independent assessment of whether as implied, clay objects are most commonly found in administrative contexts. Administrative contexts are fairly easy to recognise in the city-states of south Mesopotamia and the urban centres of upper Mesopotamia from the late 4th millennium BC onwards. Therefore, the presence or not of clay objects within palace complexes, temples compounds and storehouses and industrial zones would be easy to identify. Yet Schmandt-Besserat fails to include a discussion on this in her main publications (1992a, 1992b, 1996). From the late 4th millennium BC onwards, administration of food and food products, raw materials, manufactured goods and workers was all tightly regulated in a centralised bureaucratic system, ran by powerful elites based within the palace and temple systems. 3rd millennium BC (Early Bronze Age) Mesopotamia has revealed a number of urban settlements containing vast palace and temple complexes, inside which are suites of rooms stacked full of administration devices in the form of cuneiform inscribed clay tablets, broken stamped clay sealings, and also geometric clay objects and bullae (e.g. Uruk, Susa, Habuba Kabira south, Choga Mish). These were kept in purpose built archives within administrative quarters of a settlement.

Evidence for the centralised, large scale administration of produce in the Neolithic period is largely unattested (see Chapter 3), yet is found at a number of later prehistoric sites. Schmandt-Besserat does not include as discussion of these in her main (1992, 1996) publications. Caches of geometric clay objects, deliberately placed on floors as if archived for future reference are seen in a number of cases. For example, 5th millennium BC Tell Abada in South Mesopotamia (see figure 4.1 for exact location) contains a large tripartite building, significantly larger than all other buildings within the settlement. Building A was used over all three phases of the sites occupation. Building A of the middle and youngest phases (levels II and I) exhibit caches of clay objects, deliberately placed in the corners of a number of rooms. The objects represent a number of different shapes, mostly plain yet some incised. The caches were found in ceramic bowls, jars or in groups on the floor (likely placed in an organic container) (Jasim & Oates 1986: 352-55). No single clay objects are found, within Building A, in any other building or in the oldest settlement phase. Though their function is not clear,

this type of contextual distribution suggests an administrative function. The clay objects at Tell Abada appear to have been used by a select few within the community, from a certain point in the sites occupation onwards, with the objects not only used to count, but to store information as suggested by the caching of them for future retrieval and verification. Neolithic village life was much different to that of urban Mesopotamia (see Chapters 3 and 4). Yet the residents of Neolithic villages may still have used clay objects in the accounting sphere. Therefore a context supporting the notion of an administrative function will be sought during analysis of the data from the Neolithic sites studied (see full discussion in Chapter 5.6a).

-Computation

Schmandt-Besserat does not present any calculations of the number and range of different shapes in circulation within a particular site, a given phase of settlement, within it, and across sites of a particular time period. This data is crucial in assessing her theory, as if different shaped clay objects represented the administration of different commodities, then the same basic shapes-representing the staple goods in circulation at all sites would surely be present within all phases of all sites examined, and those sites with a more diverse range of plants, animal foods stuffs, manufactured goods and raw materials, should accordingly display a significantly more diverse clay object assemblage within a single phase of a settlement.

(vii) Influence of Schmandt-Besserat's work on the interpretation of Neolithic Clay Objects

Schmandt-Besserat is the first scholar to present a systematic study of small, geometric clay objects in the Near East. Her work (1992, 1996) covers the function of clay objects from c. 8,000 to 3,000 cal. BC, yet the data presented is overwhelmingly focused on the latter part of this time frame. Much of the evidence used by Schmandt-Besserat (1992, 1996) to justify her functional interpretation of clay objects as accounting "tokens" is taken from proto and historic period sites of the 4th millennium cal. BC onwards (Uruk, Susa and Habuba Kabira). Likewise, *Before Writing II: A Catalogue of Near Eastern Tokens* (1992b) is overwhelmingly dominated by objects of the historic period. This explains why discussions and criticisms of Schmandt-Besserat's idea tend to focus on the function and interpretation of clay objects of later times, ignoring their function in the prehistoric of the Near East. Schmandt-Besserat's 1992 study does however catalogue clay objects from a number of Neolithic sites (though in very small proportions) and her discussions of Near Eastern society with reference to the

functioning of clay objects as tokens are very much concerned with the Neolithic and later prehistoric periods (Schmandt-Besserat 1992a, 1992b, 1996).

Since the publication of her two volume book (1992a, 1992b), Schmandt-Besserat's work soon became widely known, and as such, her ideas have had a profound influence on the interpretation of small, geometric clay objects found at Neolithic, as well as later prehistoric and historic sites in the Near East. She was the first scholar to directly address the function of Neolithic clay objects, suggesting that these too, like their better known counterparts of the early historic period, were used as accounting tools. It is due to the spread of Schmandt-Besserat's theory that all small, geometric clay objects, including the earliest examples, became to be considered as evidence of early counting and administrative activities. "Token" has become the word used to identify such objects when found on Neolithic sites, with little regard taken to independently consider the function of such objects, incorporating evidence in addition to the mere appearance of clay objects, contextual or otherwise.

1-Akkermans *et al.*: The "Burnt Village" at Late Neolithic Tell Sabi Abyad

The burnt remains of Tell Sabi Abyad's level 6 village (operation I) first became widely known to archaeologists with the publication of Akkermans & Verhoeven's 1995 article entitled "An Image of Complexity: The Burnt Village at Late Neolithic Sabi Abyad, Syria". This introduced scholars to the extensive and excellently preserved village of operation I, dated to c. 6,000 cal. BC, the "Transitional Halaf period" (see Chapter 4.3e for full details and illustrations). The level 6 "Burnt Village" is arguably the best known, best documented example of Neolithic administrative activity to date, yielding hundreds of clay sealings both *in situ* and in the fill of rooms. The village comprises a mixture of large rectilinear buildings subdivided into rooms, and smaller, circular buildings or "tholoi" (figure 4.3-16). There are also a number of large ovens found both inside buildings and in external spaces between them (Akkermans & Duistermaat 1996: 17-24; Akkermans & Verhoeven 1995). A controversial interpretation of the Burnt Village was first posited by Akkermans and Duistermaat, in their 1996 article "Of Storage and Nomads: The Sealings from Late Neolithic Sabi Abyad, Syria". Expanded upon by Verhoeven (1999, especially Chapter 7 pp. 203-32), the Tell Sabi Abyad team developed a complex theory, interpreting the presence of sealings as evidence of the existence of a dual society comprised of permanent "residents" and temporary "nomads" (Akkermans & Duistermaat 1996; Verhoeven 1999).

-The Evidence

A small number of sealings have been recovered from level 3 operation I, Tell Sabi Abyad (c. 5,850 cal. BC. Table 4.3-4). Yet it is the abundance of clay sealings, a total of 312 (300 excavated up to 1996) within the level 6 settlement, along with just 1 possible stamp seal from the same level that is striking (Akkermans & Duistermaat 2004: 3; Duistermaat 1996: 342). The largest sealing concentrations are found within buildings II and IV, yet sealings are found across five buildings and twelve rooms within them. 63% of sealings have stamp seal impressions (Duistermaat 1996: 353) which can be divided into 31 design groups ranging from geometric patterns, to naturalistic designs including trees, human figures, and a horned quadruped (Akkermans & Duistermaat 2004: 2; Duistermaat 1996: 353). Similar stamp seal designs occur in a range of sizes and different shaped backgrounds, with slight variation in detail; suggesting the 312 sealings represent the circulation of at least 77 different stamp seals within the level 6 village (67 stamps are represented by the initial 300 sealings uncovered. Akkermans & Duistermaat 2004: 2; Verhoeven 1999: 211). The sealed items were all portable containers, predominately ceramic vessels and baskets, with at least 5 different container types. Impressions on the sealings demonstrate that 18 methods of sealing are evidenced (Akkermans & Duistermaat 1996; Duistermaat 1996: 342-351). X-ray fluorescence analysis suggests all level 6 sealings were made from local clay sources, or clay from the immediate surroundings, indicating "the sealing of goods was a completely local matter" (Duistermaat & Schneider 1998: 93, 96).

The buildings at Sabi Abyad level 6 have an abundance of additional *in situ* finds including ceramic and stone vases; flint and obsidian tools; pestles and mortars; grinding stones; labrets; human and animal figurines; and "clay tokens" (Akkermans & Duistermaat 1996: 17). Small geometric clay objects (balls, cylinders, discs and cones for example) number "almost two hundred", and are found in association with sealings, spindle whorls, pierced discs and figurines. Clay objects occur particularly in two rooms across two different buildings: room 6 of building II and room 7 of building V (Akkermans & Duistermaat 1996: 29; Spoor & Collet 1996: 441). Thousands of pottery sherds of a variety of wares were also recovered from the buildings, along with significant quantities of small, highly crafted bowls of limestone and chlorite (Akkermans & Verhoeven 1995: 25, 27).

- Interpretation & the Influence of Schmandt-Besserat

The entire interpretative premise of the nomads and residents scenario presented by Akkermans and Duistermaat (1996) relies heavily on ideas proposed by Schmandt-Besserat in her early work (1977c, 1978a, 1978b, 1992a) and seminal 1992 publication. The repeated use of the word "token" to describe the geometric clay objects common within the Burnt Village alludes to an acceptance of Schmandt-Besserat's ideas within the Tell Sabi Abyad team (Akkermans & Duistermaat 1996: 29, 30; Akkermans & Verhoeven 1995: 5, 8, 13, 15, 21, 24, 26). The word "token" is first used to describe the clay objects of the Burnt Village throughout Akkermans & Verhoeven's 1995 initial publication of the exceptional settlement, from the opening page onwards. It is also used by Akkermans and Duistermaat in their following "Of Storage and Nomads" article (1996: 29, 30).

The publication of "Of Storage and Nomads" (Akkermans & Duistermaat 1996) drew a wealth of attention and constructive criticism, so much so, that comments on the scenario proposed were published along with the article. Akkermans and Duistermaat (1996) focus on using the sealings to interpret social and economic organisation at the village, considering their distribution, and the stamp seal impressions found on them, in order to argue for a dual society of permanent residents and temporary nomads. Clay objects, and Schmandt-Besserat's interpretation of them as "tokens" used to administer agricultural goods in early village societies, with different shapes representing specific commodities, in a system known and understood across the entire Near East from the Neolithic period onwards (Schmandt-Besserat 1992: 150-51, 167, 168) underpins the entire argument of Akkermans and Duistermaat (1996). Telling of the depth of the acceptance of Schmandt-Besserat's ideas into mainstream thinking within the archaeology of the Neolithic Near East is the fact that Akkermans and Duistermaat do not acknowledge Schmandt-Besserat or the influence of her ideas on their theory, until discussing specifics of it, in the penultimate page of their discussion (1996: 29).

The presence of vast numbers of sealings is interpreted by the excavators as evidence of the secured, and large scale storage of goods, by an absent, pastoral component of Sabi Abyad society (Akkermans & Duistermaat 1996; Akkermans & Verhoeven 1995; Duistermaat 1996; Verhoeven 1999). This argument is based not merely on the number of sealings, but their distribution, concentrated within just three or four rooms of two rectangular buildings, along with the architecture and layout of the village. In

addition, the apparent abundance of storage rooms within the relatively small site, the fact local clays were used to make all the sealings uncovered, and the apparent absence of elites, or any form or social hierarchy at the settlement are also crucial to their argument (Akkermans & Duistermaat 1996: 24, 26, 27-30). Akkermans and Verhoeven suggest a non-domestic function of the two larger rectangular buildings (I and II) based on their internal layout, compositing small, regularly sized, square compartments, along with the internal features and contents of both buildings (1995: 11-13). The regular layout along with the bulk storage of vast quantities of grain within rooms 11, 12 and 14 of the two buildings, in combination with the large number of sealings found within building II (201 sealings came from room 6, 19 from room 7) are interpreted as to "suggest a different use" of buildings I and II compared to the other apparent "domestic" structures (Akkermans & Duistermaat 1996: 18-19). In addition to the sealings of Buildings I and II, Building V contained 57 sealings (36 in room 7, 21 in room 5, Akkermans & Duistermaat 1996: 18-19). The concentration of large numbers of sealings within a small number of rooms, and the association of sealings, "tokens", miniature vessels and figurines have led the excavators to their interpretation of the social organisation of the Burnt Village, claiming all such artefacts functioned together, in an administrative system, organised from buildings I and II (Akkermans & Duistermaat 1996: 19).

Nomads, it is proposed, used Tell Sabi Abyad's Burnt Village as a centre of exchange, for interaction with the permanent residents, and for the storage of their goods (Akkermans & Duistermaat 1996: 17; Verhoeven 1999: 231). While the "residents" lived full time in the settlement, nomads stored their belongings and in some cases, collections of small clay objects (representing goods, animals or services), sealed within rooms of rectilinear buildings. These packages were secured via the application of stamp seals, individual to each owner, preventing their packages from tampering by their fellow nomads, or the permanent "residents" of the village (Akkermans & Duistermaat 1996). The presence of hundreds of geometric clay objects within buildings of the Burnt Village, and Schmandt-Besserat's (1992, 1996) interpretation of them as "tokens" is crucial to the theory of absent nomads at Sabi Abyad. Yet only when the presence of "tokens" inside some rooms of the village is mentioned, in the context of a discussion of the various forms in which storage may have taken place, is Schmandt-Besserat finally credited (Akkermans & Duistermaat 1996: 29).

Akkermans and Duistermaat argue that collections of small clay objects within the Burnt Village represented the symbolic storage of agricultural goods, animals and services (1996: 29). The ten different shaped clay objects identified within the village are interpreted as symbolically representing different services and commodities (Akkermans & Duistermaat 1996: 30), which when needed, "could be converted at the site into the actual products each token stood for" (Akkermans & Duistermaat 1996: 29). The clay objects are interpreted as belonging to the absent nomads of the village, who by the ownership and storage of these symbolic objects, "laid claims for a wide variety of items" (Akkermans & Duistermaat 1996: 30). Akkermans and Duistermaat claim that clay objects, rather than the commodities they represented were acquired and stored by nomads for two possible reasons. Firstly, clay objects would be useful as tokens representing those items yet to be manufactured, which had to be brought in from elsewhere, or were only available at certain times of the year (Akkermans & Duistermaat 1996: 29-30). Thus the nomads relied on the settled community of the village to accept the clay objects as tokens, exchanging them for the goods or services they stood for. Secondly, in the case of bulk subsistence commodities such as cereals, nomads it is argued, used spherical clay objects to represent units of cereals owned. Rather than storing a number of small packages of cereals, each belonging to different nomads or corporate groups within the nomadic community, Akkermans and Duistermaat suggest that the nomads stored their entire grain communally at Sabi Abyad, in a single, large, purpose built grain silo (1996: 30). This, it is argued, was viewed as safer (in terms of theft, pests and longevity) and more practical. Yet as cereal ownership was not communal, private ownership was assured by the creation or acquisition, and symbolic storage of individual cereal allocations via the use of spherical clay objects (Akkermans & Duistermaat 1996: 30).

- *Evaluation*

Akkermans and Duistermaat's (1996) publication drew much attention, partly because of the unprecedented number of clay sealings from just one level of a Late Neolithic village, partly due to the exceptional extent of excavations and level of preservation within the village, yet also due to the topic. The adoption of administration systems, in the form of sealings, stamp seals and geometric clay objects amongst other tools, is often seen as part of wider social and economic developments in prehistoric communities, leading to the emergence of urban settlements in the Near East (Akkermans 1993: 4). In this context, the publication of "Of Storage and Nomads" (Akkermans & Duistermaat 1996), detailing the apparent presence of archives of

sealings and so-called "tokens", prompted widespread discussion by prehistorians and early historic period scholars, into the use of clay objects in the context of the Neolithic village for the first time. Questions such as why a complex administrative system involving a number of tools was adopted in a small, agricultural village of the Late Neolithic, how the system functioned, what was stored and administered, by who and for what purpose were all initiated by the publication. Therefore, although Akkermans and Duistermaat's (1996) interpretation of the evidence from the Burnt Village is unconvincing, and heavily reliant on Schmandt-Besserat's unfounded ideas, the publication propelled the topic into the forefront of academic debate (Bernbeck, Cleuziou, Frangipane, Le Brun, Nissen & Wright in "Comments and reply", Akkermans & Duistermaat 1996: 33-44).

Bernbeck points out that there are countless assumptions to the argument of the Tell Sabi Abyad team (Akkermans & Duistermaat 1996; Verhoeven 1999: 203-32), and their interpretation of the sealings and other administrative evidence at the level 6 village (Bernbeck in Akkermans & Duistermaat 1996: 33). Numerous lines of evidence from the Burnt Village are ignored or unsatisfactorily explained. Indeed, the reviewers comments and discussion at the end of the paper reveal the many different ways the same set of evidence can be interpreted ("Comments and reply" in Akkermans & Duistermaat 1996: 33-44). Bernbeck (in Akkermans & Duistermaat 1996) highlights that Akkermans and Duistermaat blindly take on Schmandt-Besserat's idea that tokens of different shapes, represented specific quantities of certain agricultural commodities and exchange goods, retaining fixed meanings across space and time; a claim he finds both completely unrealistic and unsupported by the archaeological evidence (1996: 33-34). He instead proposes that clay objects were not used to control exchange between two diverse groups: nomads and residents, but were merely devices functioning to monitor subsistence production, used within one group of a singular society (Bernbeck in Akkermans & Duistermaat 1996: 34).

Frangipane praises the well documented and extensive amount of work carried out at Tell Sabi Abyad, however she disagrees with many details of the published interpretative argument (Frangipane in Akkermans & Duistermaat 1996: 36-38). Firstly, she disputes the idea of a centralised distribution system operating between permanent residents and absent nomads. With the nomads presumably being pastoralist herders, who exchanged their goods with the settled agriculturalists, Frangipane finds it unlikely that members of two groups of opposing lifestyles would

need to put their goods in stores, in order to exchange with one another. She sees no evidence for the existence of nomads at all. Instead she argues that such as large scale system as evidenced at Sabi Abyad is better explained as representing the deposition of goods into a central store, by the producers of the goods themselves. The numerous producers could then have access to their own goods on a regular basis, able to add to, remove and transfer goods, albeit likely following strict procedures (Frangipane in Akkermans & Duistermaat 1996: 37).

The argument that collections of clay objects acted as symbolic representations of goods owned or owed is another contention. Not only is the count of <200 "tokens" far too few in comparison to the >300 sealings recovered for the two to have operated in the way Akkermans and Duistermaat (1996) claim (collections of tokens being stored in small containers, sealed by clay sealings). Frangipane does not believe clay objects were stored, being placed together in small containers, which were then closed with lumps of clay (sealings), and secured with the application of a stamp seal impression. In order to support notion of the caching of sealed clay objects, Akkermans and Duistermaat point to the size of the sealings. They claim that as the majority of sealings are small, they must have been used to close and seal small containers. Accordingly, the small containers could have only held symbolic "tokens" rather than the actual commodities themselves (Frangipane in Akkermans & Duistermaat 1996: 37). Though the impressions on the reverse of sealings do indicate they attached to a small item in most cases, Frangipane suggests most were attached to lids, not the rims of baskets or vessels. Therefore the potential size of a storage container with a lid of 15 to 20cm diameter, would have a neck of the same size, suggesting a substantial container, capable of holding significant quantities of goods (Frangipane in Akkermans & Duistermaat 1996: 38).

Frangipane assesses the find context of clay objects in the Burnt Village, and highlights inconsistencies between the evidence and the interpretation of the excavators (Frangipane in Akkermans & Duistermaat 1996: 38). It seems that most "tokens" were recovered loose, from apparent "archive rooms" which houses caches of broken and used sealings. The fact that the majority of clay objects were not found *in situ* in storage rooms, either along with or inside storage vessels directly contradicts Akkermans and Duistermaat's argument. Therefore Frangipane suggests it is much more likely that the geometric clay objects of level 6 were not symbolic tokens representing commodities, but were more simply used as counting tools, aiding the operation of internal

accounting activities carried out inside the administrative building or storehouse (Frangipane in Akkermans & Duistermaat 1996: 38). Likewise, if "tokens" were stored together in containers, and each represented the quantity and nature of goods withdrawn, owed or stored, sealings would not need to be retained once removed, as all necessary information would be held in the "tokens" themselves (Frangipane in Akkermans & Duistermaat 1996: 38).

Nissen's review of the use of space at Tell Sabi Abyad's level 6 village, along with the reinterpretation of all other archaeological evidence reveals external nomads are not necessary to account for the number of stamp seals and sealings used at the settlement (Nissen in Akkermans & Duistermaat 1996: 39-40). Having removed the presence of "virtual nomads" from the village, many other possible alternative explanations to account for the presence of seals, sealings and "tokens" at the site can be offered. Exchange on a local basis, within a diameter of 20 kilometres is a real possibility, and cannot be ruled out by the chemical clay analysis undertaken (Duistermaat & Schneider 1998). If nomads did constitute a component of the community, surely they would have been associated with a resident family, and thus part of a household fully resident at the site, removing the need for the secure storage of goods whilst away. Accordingly, the need for the formal exchange with the permanent agriculturalists as a dual society of two divergent groups, nomads and residents would not have existed (Nissen in Akkermans & Duistermaat 1996: 39-40).

There are many different ways in which the use of space at the level 6 village can be imagined (Nissen in Akkermans & Duistermaat 1996: 39). For example, Nissen points out that there no clear separation and independence of buildings II and III as assumed. Building X may also be an extension of building(s) II/III (figure 4.3-16. Also see plan in Akkermans & Duistermaat 1996: fig 1 p. 18). The joining of any two of these three structures would mean the presence of a single, exceptionally large unit, which could be interpreted as evidence of social differentiation within the community. The interpretation of buildings II and III as a single unit, would provide within the village, a large, multi-purpose residence with delineated areas for living, sleeping, cooking and storage. Alternatively, buildings X and II combined would present a single, large storage unit comprised of a number of small cubicles. Located centrally within the village, such a building would potentially have been used by various households, each having use of a room for the private storage of goods (Nissen in Akkermans & Duistermaat 1996: 39-40). In either scenario, an absent nomadic component is not needed, nor is it suggested

by the evidence. The "'purely speculative' communal store house with all of the additional speculations coming along with it" is likewise removed from the village reconstruction (Nissen in Akkermans & Duistermaat 1996: 39). The example of Akkermans and Duistermaat's "Of Storage and Nomads" (1996) article highlights not only the deep influence of Schmandt-Besserat within Neolithic archaeology, and the interpretation of it, but also the intense interest of the wider archaeological community, in the question of early administration and the typically associated tools.

2-Costello: the Late Neolithic ("Halaf") of Upper Mesopotamia

The work of Sarah K. Costello (2000, 2002, 2011) shows a similarly strong influence of the work of Schmandt-Besserat. The aim of Costello's' thesis (2002) is to examine the function of "jettons", within the 6th millennium BC Halaf tradition (see chapter 3) of Upper Mesopotamia (2000: 476; 2002: iv), studied primarily via the site of Fıstıklı Höyük, along with five other sites in the region (Tell Arpachiyah, Domuztepe, Girikihaciyan, Kazane Höyük and Umm Qseir (Costello 2000: 476; Costello 2002: 53-55). Costello's PhD thesis (2002) is an "archaeological investigation of symbol use and external memory" (Costello 2000: 476; Costello 2002: iv), "external memory storage" being defined in this context as the storage of information for later retrieval-used to record counts, lists and perhaps even the location of goods (Costello 2002: 37, 43). A large number of artefacts are interpreted by Costello as mnemonic aids, or as she calls them, "external memory storage tools". "Simple tokens", "complex tokens", stamp seals, cylinder seals, "sealings and seal impressions", clay envelopes (bullae), numbers and writing are all classified as such. In addition to "sherd discs" and "stone discs" which together are classed as "jettons" (see below). Costello claims that these items were used from the Neolithic in the Near East, to store information, in much the same way in which Schmandt-Besserat interprets the "tokens" of c. 8,000-3,000 BC (Costello 2000: 476; Costello 2002: iv; Costello 2011: 247; Schmandt-Besserat 1992a, 1992b, 1996).

The strong influence of Schmandt-Besserat on Costello's Late Neolithic research is immediately apparent in the terminology used. Costello uses the term "token", subdivided into the two categories of "complex token" and "simple token" throughout her work (Costello 2000; Costello 2002; Costello 2011). These three terms are taken from Schmandt-Besserat (1992, 1996), and although Schmandt-Besserat has been criticised for her lack of a clear definition of what constitutes a "token", seemingly including all manner of diverse objects (including natural pebbles, miniature vessels, small figurines and the like), Costello similarly fails to define what she includes or

excludes in her "token" category of artefact (which differs to that of Schmandt-Besserat in detail). It is clear that small disc-shaped pebbles and reused potsherds are *not* included in Costello's "token" category, as both are named as "jettons". The pebble-jettons" are defined as naturally shaped, unmodified river pebbles in contrast to the "sherd discs" which are crafted from reused pottery" sherds (Costello 2000: 246, fig. 2 p. 475; Costello 2002: iv, 55-6). These sherds are chipped and shaped into small, discs of 2 to 13 centimetres in diameter. They can have rough or smoothed edges, and be of plain or painted pottery (Costello 2000: 246, fig. 1 p. 475; Costello 2002: iv, 55).

Aside from the terminology used, Costello classifies both Neolithic "tokens" and "jettons" as "information storage tools", serving to record information in a pre-literate format. Expressing the idea developed by Schmandt-Besserat (1992a, 19996), this interpretation of the artefacts is stated as fact (Costello 2000: 476; Costello 2002: iv; Costello 2011: 247). Though it is generally agreed that geometric clay objects, at least those found in conjunction with bullae (which appear immediately before the first writing), or in other specifically indicative contexts (such as in rooms alongside stored goods, sealed containers and clay tablets administering goods and transactions) were undoubtedly used in administration from the mid-late 4th millennium BC (Nissen *et al.* 1993: 11, 12-13), they exact manner by which they were used is still debated. Furthermore, it is not widely agreed that all clay objects of the proto and historic period, functioned as administrative tools.

With Schmandt-Besserat's interpretation of historic clay objects contentious, her claim that they were used in administration, likely to store information in the villages of the Neolithic Near East is far from unanimous among scholars. Schmandt-Besserat is the first archaeologist to make such a statement of small geometric clay (and stone) objects in the Neolithic period. Yet this theory, is presented as undisputed fact by Costello. It serves as the starting point from which to further explore the role of jettons in the Halaf Neolithic of the Near East. Costello does not entertain the notion that "jettons" and "tokens" may have had a function outside the sphere of "information storage" or "artificial memory devices" at this time. The aim of Costello's research therefore is not an independent, unbiased investigation into the function of such objects, but a development of Schmandt-Besserat's original 1992 idea, considering specifically what type of information "jetons" held at Halaf sites (Costello 2000; Costello 2002: iv).

Costello claims her work is original as she challenges the typically accepted evolutionary model of Schmandt-Besserat (1992, 1996), that is that Neolithic tokens developed, being used in conjunction with bullae, clay tablets and seals resulting in the advent of writing at the end of the 4th millennium BC (Costello 2002: iv). She criticises Schmandt-Besserat's claim that three dimensional clay objects were the direct inspiration for early cuneiform numerical symbols (2002: 57). She also attacks the scope of the potential meaning of the messages transmitted by tokens proposed by Schmandt-Besserat, which in her opinion are incorrectly assigned a "a very narrow role, concerned with commodities" (Costello 2002: 96-97). Originality is also claimed, unlike most studies of "memory tools" in the prehistoric Near East, Costello points out that the evidence she uses to assess the role of information storage devices in the Neolithic, comes from that time period and not via analogies to proto and historic methods of information storage (as with the bulk of Schmandt-Besserat's work) (Costello 2002: 4, 57). Clearly Costello does not recognise the influence of Schmandt-Besserat on the basic assumption of her research.

Costello, whose research supposedly concentrates on "jetons", is overly concerned with "tokens" (2002). Agreeing with Schmandt-Besserat (1992a, 1996), Costello constantly repeats that as "the other common memory tool of the Neolithic" (2002: 68), from their first appearance in the early Neolithic of Syria, "tokens" served the purpose of the "storage of some sort of information" (2002: 62). Specifically of jetons, Costello suggests they may have been used to record information outside of the economic sphere, claiming this idea to be to be revolutionary in light of Schmandt-Besserat's research (2002: 2, 96-97). Yet Costello does not consider a function of jettons outside of recording or "information storage" sphere, reflecting the effect of Schmandt-Besserat's scholarship on her range of interpretative options. Jettons, along with "tokens", seals and sealings she claims, were used as mnemonic devices, to record information.

Costello claims that the storage of information via small portable artefacts has the potential for many functions, not only within the economic realm, but myths, legends, debts and amounts owed (Costello 2002: 2, 181-82). Yet convincing evidence for such a claim is provided. The variety in jeton size, raw material (pot-sherd or natural pebble) and the presence or not of paint (on the sherds only) were variables by which different types of information were stored (Costello 2000: 476; Costello 2002: iv, 3-4, 183). This totals between three to nine classes of jetons being identified across the six study sites (Costello 2002: 151, 154-59, table 6.1 p. 156). She concludes that at least at 6th

millennium BC Fıstıklı Höyük, whilst seals and sealings were related to "centralised administration and storage", jettons in contrast, are often found in contexts alongside animal bone and shipped stone tools (Costello 2002: 206, 208-12, 212-13, tbl. 7.9 p. 206). As Chipped stone tools were used to process animals, Costello asserts that jetons in the Halaf period were used to record information related to subsistence and animal products, as part of a non-centralised system recording the processing and likely distribution of animal products (Costello 2002: iv, 4-5,). They were therefore, used to record information related to economic activity.

Despite critiques Schmandt-Besserat, and the clear attempt to produce original work, Costello's research, and the conclusions she reaches is undoubtedly an extension of Schmandt-Besserat's own research and ideas. Her later 2011 paper is broader in focus, considering not only "tokens" and "jetons", but the "visual culture of the Neolithic" (Costello 2011: 247) via the ""wealth of memory technologies [which] preceded writing in the Near East" (Costello 2011: 259). Yet it still reflects the influence of Schmandt-Besserat's theory. Costello stresses that unlike Schmandt-Besserat's interpretation of the transmission of meaning through material culture across the entire Near East region c. 8,000-3,000 BC, meanings change from place to place, and over time (Costello 2011: 257). Yet "tokens", "stone discs" and "sherd discs" remain central to her paper, listed alongside stamp seals and cylinder seals as objects to store information pre-4th millennium, pre-writing; reflecting the permanence of Schmandt-Besserat ideas in Costello's own research (Costello 2011: 247).

3-Current Neolithic Excavation Projects

Debate regarding the methods by which clay objects could have functioned as counting and recording devices in the context of Neolithic village communities has been extremely limited. The examples above represent the current extent of such literature, highlighting the degree to which Schmandt-Besserat's interpretation of clay objects as symbolic administrative tokens has been accepted as mainstream, rather than just one possible, and contentious interpretation of the functioning of such objects within prehistoric communities. This appears to be due in part, to the lack of alternative functional explanations, and the common approach of ignoring clay objects, rather than taking on the colossal task of tackling the question of their function, independent of Schmandt-Besserat's previous research.

However, with excavators becoming ever more aware of the potential presence and importance of small geometric clay objects at Neolithic sites in the Near East, they are only now, in the twenty first century being included in publications. This development is due at least partially to the awareness raised by Schmandt-Besserat and debates on her work. Yet legacy of Schmandt-Besserat also has less positive impacts. Clay objects are commonly labelled "tokens" in publications and on-site, with little or no evidence supporting this functional interpretation, or justification of the use of this term (i.e. the Central Zagros Archaeological Project-Matthews *et al.* 2013 & CZAP website 2014 and at Tepe Zagheh- Nashli & Moghimi 2013. See Appendix J for full details). This attests to the overwhelming influence of Schmandt-Besserat's work, and the continued dominance of her ideas in this field.

2.3(b)-GAMING PIECES

Aside from the various counting and administration related functions described above, the interpretation of small, geometric shaped clay objects as gaming pieces is the main alternative argument posited for Neolithic and later Near Eastern objects. This idea is a very plausible explanation for the presence of clay objects at Neolithic sites, along with the possible Neolithic gaming boards (Simpson 2007). The interpretation of clay objects as gaming pieces better explains the large variety of shapes and designs, why clay objects are not found at all Neolithic Near eastern settlements, and yet why they generally appear in great numbers when they are present.

(i) Neolithic Clay objects as Gaming Pieces

The motivation for the interpretation of Near Eastern Neolithic clay objects as gaming pieces is seldom explained. The term is often found in site reports, attached to small, geometric shaped clay objects, and is presumably based on analogies of modern and historic board games, rather than the context of clay objects within the site, the presence of playing boards or other possible gaming related artefacts. At the Neolithic site of Jarmo in the Zagros foothills for example, clay figurines and other clay objects are published together as an artefact category (Broman Morales 1983). Of the many differing forms of clay object, those classified as "stalk objects" (181 examples) are described as being "rather more like gaming pieces" as opposed to those classified as "figurines", "children toys" and "unfinished lumps"(Broman Morales 1983: 386). There is no explanation for this assertion other than the form of the pieces.

Similarly, some clay objects from Neolithic Jericho are interpreted as possible gaming pieces in the final site reports (Kenyon & Holland 1982; Kenyon & Holland 1983). At Jericho, all clay objects, even those with no clear function are published (under the title "Miscellaneous Clay"), including an illustration and very brief description (Kenyon & Holland 1983: 814-18). One of the objects in this section (registration number 2886, PPNA) is described as an incised clay disc, "possibly a gaming-piece" (see figure 2.6). Again, no reason for this interpretation is offered and the comment appears to act more as a description rather than a functional interpretation (Kenyon & Holland 1983: 815). Aside for the addition of an incised cross, object 2886 appears to be very similar to registration numbers 2764 and 2875, neither of which are described as possible gaming pieces. Conversely, in the description of "Figurines and Miscellaneous objects" in *Excavations at Jericho Volume Four* (Kenyon & Holland 1982: 551-63), an entire subcategory of "Pottery Neolithic A" period objects are classified as "Gaming Pieces" (figure 2.7). They are a mixture of clay and stone artefacts (registration numbers 12: dark grey stone, 2709: green stone, 455, 184, 185: clay), and aside from their similar conical form and date, no information such as the context they were found in and associated objects is detailed. Again they appear to have been classified as gaming pieces on form alone.

(ii) Neolithic Near Eastern "Gaming Boards"

Despite the lack of supporting evidence accompanying the designation of some Neolithic Near Eastern clay objects as gaming pieces, the interpretation of at least some shapes acting as counters as part of a board game has support in the from at least thirteen potential gaming boards excavated from six Neolithic sites (Bartl pers. comm.; Simpson 2007: 5-7). Traditionally, definitive evidence for the first gaming boards was thought to hail from the 3rd millennium BC, attested by the well preserved, ornate examples of gaming boards and pieces from both Ancient Egypt and southern Mesopotamia, alongside the many Egyptian depictions of board game playing found in tombs from the Old Kingdom onwards (c. 2,686-2,181 BC) (Becker 2007, Hallo 1993, Hoerth 2007, Kendall 2007, Kilmer 1993, Murray 1952, Shaw & Nicholson 2002: 310, Simpson 2007).

Yet game boards of limestone and plaster have been excavated in recent years, adding support to the interpretation of the many geometric clay objects found at Neolithic Near Eastern settlements as gaming pieces (Simpson 2007: 8). The Neolithic boards have a wide geographic distribution, having been excavated at Beidha (4 boards, see

figure 2.8), Wadi Faynan 16 (a "number" of miniature boards), 'Ain Ghazal (more than 1, figure 2.9) and Ghwair 1 (1 potential, figure 2.10) and in the Southern Levant, El-Kowm 2 (4) located just west of the Middle Euphrates in modern Syria, Wadi Tbeik (2) in the centre of modern Sinai, Chagha Sefid (1, figure 2.11) in the Deh Luran plain, to the east of the southern Tigris River and Shir (a "few", figure 2.12) modern West central Syria (Bartl pers. comm., Finlayson 2011, Simmons & Najjar 2006: 88, fig. 7 p. 88; Simpson 2007: 5-7). Where recovered from stratified contexts, most boards date to the 7th millennium BC (Beidha, Ghwair, 'Ain Ghazal, Wadi Tbeik, El-Kowm 2 and Shir) (Bartl pers. comm.; Simmons & Najjar 2006: 88, fig 7 p. 88; Simpson 2007: 6-7). The example from Chagha Sefid dates to the 6th millennium BC (Surkh phase c. 5,700-5,400 BC) and the Wadi Faynan miniatures boards are the earliest reported, as the site was occupied from the mid-10th to the mid-9th millennium BC (Finlayson, Mithen, Najjar *et al.* 2011: 8183). All twelve boards are remarkably similar. The presence of gaming boards with hollow depressions suggests playing pieces were used with these boards. Simpson suggests that the small size and shallow depth of the holes in the twelve example boards published demonstrates that a "relatively limited number of small gaming pieces was used" (Simpson 2007: 7). In this respect, small pebbles, seeds and animal droppings may have acted as counters, yet the clay objects abundant at many Neolithic sites are also probable contenders as gaming pieces, as the small size of the majority of these objects would fit into the depressions on the boards (Appendix H table A.H-4b).

The restricted distribution of gaming boards across Neolithic sites, in comparison to the abundant clay objects could be advanced to dispute the gaming piece theory, however, boards need not only be made from stone (or plaster). The relatively modest number of surviving examples may represent rare examples of the more elaborate type of gaming board utilised in the Neolithic, with the majority of boards for everyday use being marked on non-worked pieces of stone, (as evidenced in the later Near east in ancient Egypt), as well as being sketched simply on the ground or onto wet clay (see 2.5(b) below for discussion). This seems likely, as post-Neolithic there is no evidence for gaming boards in the Near East until the 4th millennium BC, where crudely cut stone boards with hollow depressions, very similar to the Neolithic examples appear again at many sites in the southern Levant as well a number of examples from Cyprus. The best evidence comes from Early Bronze II Arad, Early Bronze II and III Bab edh-Drah', Early Bronze IV Khirbet Iskander and 'Ein Ziq (Simpson 2007: 8).

(iii) Comparative Evidence A: 3rd Millennium Near East

Abundant evidence of board games in the Near East is evidenced from the 3rd millennium BC onwards. The Royal Tombs from the Cemetery at Ur (graves dated to the earliest period of the cemetery's use, the Early Dynastic III period of the mid-3rd millennium BC, see map figure 4.1 for location) have revealed a number of board games, consisting of a hollow box accompanied by gaming pieces (figures 2.13, 2.14 and 2.15. Pollock 1999: 2, 210, Woolley 1934). Representing gaming of the upper echelons of society, Ur's gaming boards and pieces are all exquisitely made, and well preserved. The playing pieces vary in form, and include square shaped counters inlaid with shell, depicting detailed animal scenes (figure 2.16). Similar square and round counters, each with five dots inlaid on the surface in alternate black and white (figures 2.14 and 2.16), and "dice "(cones) inlaid with small dots of lapis lazuli and gold accompany the boards (figures 2.13 and 2.17). The use of wood in the construction of Ur's gaming boards indicates similar items may have been widespread in distribution, as supported by the similarly shaped, yet differently styled, contemporary wooden board from Shahr-i-Sokhta (modern Iran) (figure 2.18a. Becker 2007). The recently discovered collection of 49 small stone gaming pieces from Başur Höyük, an Early Bronze Age site in southeast Anatolia, as well as finds of gaming tables and boards at other 3rd millennium sites (i.e. Bab 'edh Dhra -David 1979: pl. 6-p. 15, Lee 1982: 171-72; and Arad – Lee 1982: 172, pl. XV A) support the notion that board games were both commonplace and widespread across the entire Near East from at least the early 3rd millennium BC (figure 2.18b. Lorenzi 2013).

(iv) Comparative Evidence B: Dynastic Egypt

Evidence from Ancient Egypt similarly shows board games were a popular past time from at least the 3rd millennium BC (Old Kingdom c. 2,686-2,181 cal. BC) (Shaw & Nicholson 2002: 310). The culture of dynastic Egypt exhibits a set repertoire of board games that were used by all social classes until the end of the dynastic period and beyond (David 1979, Der Manuelian & Jaquet-Gordon 1987, Freed 1982, Hoerth 2007, Kendall 2007, Thomas 1990, Vandier 1964). In most cases, playing pieces are found in association with their game board. The archaeological evidence alongside numerous depictions of board game playing from tomb paintings, allow for the reconstruction of game sets, and a definitive interpretation of the small objects used as gaming pieces, often found in tomb contexts. "Senet", the most well-known of the Egyptian game board collection is attested on tomb walls from as early as the 1st Dynasty (c. 3,100-2,890 BC) of the Early Dynastic Period (c. 3,100-2,686 BC; Shaw & Nicholson 2002: 310), with the

last reference of the game dating to the 3rd century AD (Vandier 1964). Senet is played on a flat, rectangular board, with tall, conical shaped playing pieces depicted in most iconography and archaeological examples, throughout the entire dynastic period (see figures 2.19 and 2.20). The playing pieces bear a remarkable similarity to the "miscellaneous limestone objects" found at Neolithic Çayönü (figure 2.21. See later in chapter for discussion) and many of the Neolithic "cone" shaped clay objects.

The game of "Mehen" or "Serpent" was another popular Egyptian game, played on a circular, coil shaped board (figure 2.22) (Kendall 2007: figure 4-p. 34; Vandier 1964: 487, 489; Der Manuelian & Jaquet-Gordon 1987: fig. 12-p. 47). Mehen utilises simple "pebbles" or "marbles" (figure 2.23), as well as more sophisticated animal shaped playing pieces. These are most commonly found in the form of lions (figure 2.24), although other animals including dogs have been found (figure 2.25). Archaeological examples of Egyptian gaming tend to hail from the graves of the upper classes, and as such are made from semi-precious stones and ivory. Yet the use of clay and other materials by the lower classes is supported by textual references, iconography and a few, rare archaeological examples. The incorporation of what are essentially zoomorphic figurines, alongside spherical objects matches two of the object categories, commonly assigned as clay "tokens" by Schmandt-Besserat and others, offering support for the use of some of the clay object of the Neolithic as playing pieces. Wooden or clay gaming pieces may have been used by the general population, carved or moulded into simple geometric shapes rather than the highly ornate lions and jackals as presented in the illustrations referred to above. An exceptional example of this comes from the Middle Kingdom workers settlement of Kahun located in Lower Egypt. A clay slab (dimensions not published) complete with horizontal and vertical lines, creating squares across the entire surface is a likely contender as an easily made, humble Egyptian gaming board (David 1979: pl. 6-p. 15) (figure 2.26).

The evidence from dynastic Egypt offers a comparative set of objects to the Neolithic clay objects, in a secure context, and with a definitive game piece function. The evidence from Dynastic Egypt cannot be said to prove the function of the Neolithic pieces, yet many of the shapes and sizes are very similar to the Neolithic examples, especially the spheres and conical-like Senet pieces. An Egyptian style "Hounds and Jacks" gaming board from the south Levantine site of Megiddo (dating to the Late Bronze Age) supports the idea of cross cultural gaming exchange between the Levant and Egypt (figure 2.27). Likewise, a collection of 30 incised obsidian discs in the

Garstang Museum, University of Liverpool (figure 2.28, re. no. E.5432) are identical in size, style and form to Schmandt-Besserat's 4th and 3rd millennium BC "tokens" (categories "2:30" 1996: 132 and categories "3:21, 3:22 and 3:33" 1996: 134; 1992b: xxii. Also see Schmandt-Besserat 1996: fig. 9-p. 40, 132, 136; Schmandt-Besserat 1992b: nos. 3:21, 22 & 23 p. xxiii; Robinson 2007: 59).

(v) Discussion

The interpretation of clay objects as gaming pieces may explain many of the questions left unanswered by the interlinked administration, counting token and precursor of writing arguments regarding the function of Neolithic clay objects. Firstly, the presence of objects of differing shapes and sizes, degrees of refinement and decoration (in the form of incisions and impressions) can better be explained as displaying difference in aesthetics, as well as the time and care taken in the crafting of these objects by the individuals that utilised clay objects in gaming. The similar geometric shapes displayed are accounted for, not because the objects represented set symbolic entities recognised across the entire Near East, but are merely the most common geometric shapes. The presence in large numbers at some sites and absence from others is likely due to differential popularity of this particular form of board-based gaming across Near Eastern sites.

Gaming pieces may also have been made of pebbles, unremarkable and unadulterated in form, as well as small twigs, disused animal bones, pieces of animal dung, seeds, nuts, beans or any other small items common place in the domestic setting, and thus not likely to be interpreted as functioning in gaming unless found in direct association with a game board (Simpson 2007: 7; Walker 2007: 250). This is supported by the example of Mancala (or Mankala), a popular and ancient board game often hailed as the oldest game board in the world (Walker 2007: 250). Still played today in many parts of Africa and the Middle East, mancala uses a board with hollow depressions, with playing pieces consisting of small, natural pebbles, always kept in a cloth bag (see figures 2.29 and 2.30). Likewise, Tyldesley states that in Ancient Egypt, organic, naturally occurring objects were preferentially used in gaming, over the creation of ornate gaming equipment (2007: 11). Taking the dominance of organic gaming materials into account, the restricted distribution of known game boards in the Neolithic Near East is easily explained by the scenario of temporary boards being drawn into the ground with a finger or stick, or marked with organic materials for example sticks arranged on the ground to create a playing surface untraceable in the archaeological record (Murray

1952: 1). This is still evidenced in many countries today with children using chalk to create an ephemeral surface for playing hop scotch.

2.3(c)-CHILDREN'S TOYS

The interpretation of small geometric shaped objects as toys (distinct from gaming pieces used by adults) has been proposed in the past to explain the presence of small figurines at Near Eastern sites in the Neolithic and later periods. The perception of other shaped clay objects as toys generally occurs when all small clay objects from a sites' artefact assemblage are classified together, with figurines, geometrics and a diverse range of other ambiguous objects assumed to hold the same function. Understanding figurines found outside the Neolithic Near East as children's toys, was also common amongst archaeologists in the recent past. For example, Petrie immediately assumed the Predynastic (c. 5,500-3,100 BC. Shaw & Nicholson 2002: 310) figurines he frequently recovered, were children's toys, comparing them to the dolls of modern Europe (Ucko 1968: 409). This interpretation of figurines as children's toys is still held by some scholars, such as Talalay (1993). Speaking of a group of Early to Late Neolithic, heterogeneous Greek figurines, Talalay states they were created specifically to entertain children while their mothers worked (Talalay 1993). Figurines found at Neolithic Near Eastern sites were also frequently interpreted (and dismissed) as toys in early excavations. They are now generally regarded by archaeologists as being made and used by adults, rather than as children's play things, however they are still tentatively proposed as being toys by some in reference to Neolithic Near Eastern sites (i.e. Broman Morales 1983).

(i) The Neolithic Near East

"Toys" appears to be the interpretation of objects that appear to replicate life in miniature (such as humans, animals and vessels), especially if they are crudely made, from the clay abundant at many Neolithic sites in the region, and therefore assumed to have been crafted by children. Yet there is generally no evidence for explaining small figurines and geometric clay objects within Neolithic sites of the Near East as children's toys, aside from their comparison to modern western toys, which often replicate adult life in miniature. Broman Morales' analysis of the "Figurines and Other Clay Objects" from the Neolithic Jarmo is a perfect example of the grouping together of many differing forms of objects, tentatively assigning functional interpretations of them based on small differences in form (1983). The apparent "casual" method of production (evidenced by the fact many items have been left to slump before hardening), the many

impressions found on their bases, resulting from the unsmooth surface upon which they were made or left to harden, as well as the many simple forms produced, leads Broman Morales to the conclusion that many (but not all) of the many forms of clay objects from Jarmo, including the "balls", "little clay vessels", and the zoomorphic figurines, represent toys (Broman Morales 1983: 393). These examples of toys, she claims, represent only a small selection of the items Neolithic children played with (Broman Morales 1983: 393). They are contrasted to the "sophisticated" and supposedly adult-made, anthropomorphic figurines, and the gaming piece-like "stalk objects" (also geometric shaped-objects see Chapter 9), both of which are viewed as the playthings of Jarmo's adult population (Broman Morales 1983: 386). The interpretation proposed by Broman Morales and others, with regards to use of Neolithic clay objects as "toys" is questionable. Many of Jarmo's animal figurines for example, are as well-crafted as their human counterparts. Also, the presence of crudely made objects, and objects which display impressions of their drying surface, is not evidence that they were either made by or for children as toys.

(ii) Later Prehistoric "Toys"

One of the few interpretations of clay objects as toys with any real supporting evidence comes from 5th to 4th millennium BC Tepe Gawra (levels XIX, XVII, XI-A and X), in upper Mesopotamia. Extensive lateral excavations have revealed a number of caches of small, geometric shaped clay objects, notable not just due to their caching, but because overall, these objects are rare at the site. The clay objects are well stratified, with full contextual information published. Their context, along with the appearance of the objects is used to assign a function. The excavators do not propose all geometrics in the caches functioned in the same realm, yet all, regardless of practical function, are interpreted as being status symbols. The overall limited number of clay objects at Tepe Gawra, along with the fact most are recovered from grand and richly adorned tombs, led the team to this conclusion (Jasim & Oates 1986: 352). In addition, the presence of geometric clay objects, along with near identical items in alabaster (in "child's grave" level XI-A) and marble (various tombs of level X including T102 110, 107 and 114) adds support for the status symbol interpretation (Jasim & Oates 1986: 352).

The small alabaster geometric objects recovered from the child's grave consisted of four "spheres", three "hemispheres" and two "knobbed spheres". All were originally held in a single container (Jasim & Oates 1986: 352). All evidence combined leads Tell Abada's excavators to suggest the alabaster geometrics were not used in accounting as

"tokens" but rather that the presence of the items in a child's graves strongly suggests their function as a toy or possible gaming pieces (Jasim & Oates 1986).

Lastly, in a publication entitled *Toys and Games from Kahun in the Manchester Museum,* David (1979) presents items interpreted as children's toys and games. This includes the example of a well preserved, woven string slingshot that was recovered complete with a number of pellets in the form of small, spherical clay balls (figure 2.31). The dimensions of the clay spheres are not published, though they appear to be comparative in size to the commonly found clay spheres of the Neolithic Near East (David 1979: pl. 4 p. 15). The existence of such items, albeit from a distant time and region to the Neolithic Near East, is another example of the possible function of at least some of the Near Eastern clay objects, which may have been used in conjunction with slingshots, by children as part of play, or by adults for more serious activities.

2.3(d)-DISCUSSION

Analysis of previous interpretations of clay objects highlights the lack of attention paid to this large and common object category, especially by prehistorians. The work that has been carried out is overwhelmingly focused on the later, more elaborate pieces, with the origins of the appearance and original function of the objects in the Neolithic of the Near East largely ignored. The dismissal of geometric clay objects as a genuine object category is apparent in site reports where the objects are not published, or referred to in passing, with little description and no illustrations. This suggests a complete lack of interest in understanding the function of the objects, and possibly even the refusal to accept the items as a true artefact category. Clearly the overwhelming majority of clay objects found on Neolithic sites were purposefully made, even if some are crude in comparison to the later more refined grooved and incised objects of the 4th to 2nd millennium BC (as evidenced in objects from Uruk and Susa, and published Schmandt-Besserat 1992b; see for example Schmandt-Besserat 1996: fig. 9 p. 40; 1978a: 153). Similarly, the small, geometric shaped stone objects from Çayönü are published in the site report, yet discussed very little, only remarked on in passing as "ornaments of polished stone…their function is unknown" (Çambel & Braidwood 1979: 149, 151). To date, Schmandt-Besserat has been the main and only successful promoter of clay object as a serious artefact, however her work is overly focused on the later material and many of her interpretations lack supporting evidence.

Much work has been carried out in the field of linguistics, the origins of writing and the beginnings of counting and accounting systems, however, the role of clay objects within this, generally follows the model proposed by Schmandt-Besserat, with no consideration that clay objects might be completely unrelated to any of these developments. Evidence in the form of gaming boards and pieces provides a strong case for the use of at least some shapes of Neolithic, and later clay objects as gaming pieces rather than accounting tools. New work in progress by Woods (2014) promises to challenge Schmandt-Besserat's theory of a seamless transition of symbolic recording from clay objects to cuneiform in the 4th and early 3rd millennium. Few other people have challenged Schmandt-Besserat's work by directly proposing a viable alternative use of clay objects; yet since her main publications, many more Neolithic sites have been excavated, revealing additional collections of clay objects from well stratified contexts, providing an abundance of additional material to be studied in a new light.

2.4-PART TWO: ADMINISTRATION-CLAY OBJECTS & OTHER NON-LITERATE RECORDING METHODS

2.4(a)-COUNTING & ACCOUNTING IN THE NEAR EAST

(i) CURRENT THOUGHT: SCHMANDT-BESSERAT'S ARGUMENT

As outlined above, Denise Schmandt-Besserat is the pre-eminent scholar on the subject of the use and functioning of Near Eastern geometric clay objects. While alternative suggestions have been proposed for the function of certain shaped objects at some sites (in the later part of her study time-frame), and the Berlin Group of scholars have highlighted their concerns with many aspects of her theory (see section ii below), Schmandt-Besserat's ideas have not yet been replaced, remaining the most influential within the study of clay objects. Below follows a more detailed summary of Schmandt-Besserat's theory as published in 1992 and 1996, along with the assessment of her ideas, as received by supporters and critics (sections ii and iii). Finally, alternative functional interpretation of clay objects, all focused on historic period objects and their operation within the accounting sphere are presented (section iv).

Prehistoric "Plain Tokens": simple counting c. 8,000-4,000 BC

Stylistically, Schmandt-Besserat divides clay objects into "plain tokens" and "complex tokens". "Plain tokens" (Schmandt-Besserat 1992a: 35-48) are simple, undecorated geometric shaped objects, "complex tokens" (Schmandt-Besserat 1992a: 49-92) are decorated and crafted into a wider range of both geometric and naturalistic forms. "Plain tokens" are prehistoric, dated to between 8,000 and 4,000 BC (figure 2.2). The

term “complex tokens” (figure 2.3) describes objects from the urban, historic period of c. 4,000 BC onwards , “Plain tokens”, Schmandt-Besserat argues, are “characterised by a remarkable continuity” in appearance for over four millennia, until the 4th millennium when “a major change occurred in the token system” (1992a: 13, 16, 17, 24, 36, 37, 49-92; 1996: 7, 16-17, 102, 103). She argues that the first tokens of the Near East date to c. 8,000 BC and initially appeared at semi or fully sedentary farming villages (such as Tepe Asiab, Ganj Dareh Tepe, and Tell Mureybet) (Schmandt-Besserat 1992a: 93; Schmandt-Besserat 1996: 7). Schmandt-Besserat claims that over the course of the later Neolithic and into the subsequent Chalcolithic and Uruk periods (c. 7th to 4th millennium BC) “plain tokens” continue to be found, appearing in the same simple form, at an increasingly diverse range of sites such as caves, nomadic herders’ camps, but most commonly at the dominant form of site in the Neolithic: fully sedentary farming villages (Schmandt-Besserat 1992a: 93).

-“Plain tokens” in Neolithic agricultural villages

Schmandt-Besserat uses the simultaneous appearance of clay objects and agriculture during the Neolithic period of the Near East, as well as the assentation that clay objects are most often found in clusters of 2 or more (assumed to have been stored together in containers such as baskets, textile or leather bags, wooden boxes, and pottery bowls and jars, as evidenced at 5th millennium Tell Abada. Schmandt-Besserat 1992a: 97, Jasim & Oates 1986) to claim clay objects were conceived of, and from their initial appearance, produced in order to function as tools, in the administration of agricultural produce. She supports her theory by the supposed co-appearance of clay objects and the beginnings of agricultural food production, as evidenced by the site of Mureybet (Schmandt-Besserat 1992a: 99). Mureybet, on the Upper Euphrates (figure 4.1) was occupied from c. 8,500 BC. Clay objects are not evidenced until 500 years into the site’s occupation in level III (c. 8,000 BC), alongside many developments she interprets as indicative of agriculture, increased complexity and population growth. Cereals begin to be stored, as evidenced by large rectangular silos. A significant increase in cereal pollen quantities and an increase in the obsidian trade are attested. The size of the site is also extended (Schmandt-Besserat 1992a: 98-99).

The other 8th millennium BC clay object yielding sites included in Schmandt-Besserat’s analysis are Tepe Asiab, Ganj Dareh Tepe, Cheikh Hassan and Tell Aswad. All are used to defend her interpretation, claiming that these sites too relied upon grain consumption and that all (excluding Ganj Dareh Tepe) have obsidian present

(Schmandt-Besserat 1992a: 99; Schmandt-Besserat 1996: 29). This evidence is presented as clear support for the theory that the appearance of clay objects for the first time in the Near East clearly coincides with the practice of intensive agriculture, and as such, this must be related to their functioning. By extension, if we accept, as Schmandt-Besserat claims, that "plain tokens" acted as counting tools, then agricultural produce must be the element that was being counted (Schmandt-Besserat 1992a: 99; Schmandt-Besserat 1996: 7).

There are many errors and inconsistencies in the above claims. The presence of a sample of grain at a site does not equate to evidence of a reliance upon grain, nor proof that the grain was morphologically domestic. Recent developments in archaeology have pushed back the advent of animal herding and the earliest plant cultivation much nearer to the start of the Neolithic period (Chapter 3), and the earliest clay objects of the region appear from the 10th millennium at some sites. The supposed co-appearance of clay objects and agriculture is not as clear as suggested, with the development of plain cultivation and animal husbandry a gradual not an immediate development, datable to a specific year. Furthermore, examination of the published evidence does not suggest such a stark contrast between "plain tokens" of a limited range of basic geometric shapes, followed by an explosion in the degree of diversity of forms and decoration c. 4,000 BC as claimed (Schmandt-Besserat 1992b). Nevertheless, Schmandt-Besserat is clear in her assentation that clay objects were used to count, and as they appear simultaneously with agriculture in the Near East, must have been created to meet the increasing administrative demands of the agricultural economy. Despite no clear demonstration of an increased diversity and decorative elaboration of later "complex tokens" (this claim is difficult to assess with the vast majority of "complex tokens" catalogued coming from two proto-and historic sites Uruk and Susa (Schmandt-Besserat 1992a: 32-33; Schmandt-Besserat 1992b), the increased range in clay object forms is explained as reflecting the increased complexity of society of the early historic period. From the end of the 4th millennium, she states that administration was a task which had become increasingly complex. Thus "complex tokens" were needed to account for an increasing range of goods in the newly urbanised societies of the Near East (Schmandt-Besserat 1996: 7, 102).

- Neolithic farming versus pre-Neolithic, Hunter-Gatherer societies

Schmandt-Besserat supports her interpretation of the earliest, Neolithic clay objects as counting tokens which were used in the administration of agricultural produce by

looking back at pre-Neolithic, pre-"token" societies. Earlier hunter-gathers of the Near East she claims, did not need to count or record resources. They had unlimited supplies and reciprocal relationships based on the exchange of goods, thus had no private ownership or recording needs, according to Schmandt-Besserat (Schmandt-Besserat 1992a: 167; Schmandt-Besserat 1996: 100). The survival of Palaeolithic hunter-gatherers in the Near East depended on seasonal events, thus time, rather than quantities of goods was what these people needed to tracked, count and record (Schmandt-Besserat 1992a: 167). Schmandt-Besserat stresses the apparent egalitarian nature of societies represented by the hunter-gatherers of the Palaeolithic in the Near East. She interprets these societies as having no use therefore for counting, accounting and subsequently, clay "counting tokens". She contrasts these with the subsequent, "rank societies" of the Neolithic, claiming that this new, hierarchical social structure is what made accounting necessary. Living in highly structured, ranked societies based upon agriculture, an "entirely new token system was created at that time to keep track of goods" (Schmandt-Besserat 1992a: 170; Schmandt-Besserat 1996: 102).

Like the interpretation of Neolithic agricultural villages, Schmandt-Besserat's evidence for the egalitarian nature of Palaeolithic societies, versus the highly egalitarian nature of Neolithic societies is contentions and unsupported by any evidence in her publications (Schmandt-Besserat 1992, 1996). Furthermore, this scenario is highly simplistic, suggesting a single form of social structure operated over the entire Palaeolithic of the Near East, to be replaced by another single form in the subsequent Neolithic. The evidence from both periods is far more diverse (see Chapter 3). In addition, even if we accept the notion of an egalitarian, mobile, hunter-gatherer community juxtaposed with a hierarchical, sedentary, agricultural one, there is no substance in the suggestion that the former would have had absolutely no need to keep track of food stuffs, but would only need to track the passage of time, whilst the latter had no need to track time, only to count and record agricultural produce.

-Symbolic Representation in Neolithic "plain token" accounting

The earliest tokens were used to count (Schmandt-Besserat 1992, 1996). Furthermore, from the Neolithic period of "plain tokens", clay objects were not just counting tools, but mnemonic devices, with each distinctive geometric shape "representing a precise quantity of a product" (Schmandt-Besserat 1992a: 161). In later publications, this argument is developed to argue that from the Neolithic, "tokens" did not represent merely numbers, but specific commodities and units of them. With specific shapes

acting as symbols for goods, Schmandt-Besserat (2007, 1996) claims the two first token forms attested in the Neolithic represented the two most important commodities and symbolised units of cereal and animal counts (Schmandt-Besserat 2007; 1996: 102). Either way, it is clear that from the Neolithic period, Schmandt-Besserat perceives clay objects as mnemonic devices, part of a regional and set symbolic system, being used to not just count, but as a means of "communication and record keeping" (Schmandt-Besserat 1992a: 161). Within this system, news signs and "tokens" could be added. The system worked as a "fully fledged code" across the Near East, with the potential to become far more complex in the historic period (Schmandt-Besserat 1992a: 161-62). No clear evidence for this assertion, such as the proportions of different shaped tokens at the earliest token yielding sites is presented. Nor are any details of exactly why and how these goods were counted. The only evidence stated is the fact that grain and "flocks" were the staple of 8th millennium economies in the Near East, and thus must have "played a dominant role in the first accounting."

Increasing social complexity: The Neolithic need to count & record counts

-Palaeolithic counting & tallies

Schmandt-Besserat devotes a significant section of her argument to a discussion of counting, claiming humans only needed to count beyond the number three, once society had become sedentary, hierarchical and "complex". She uses this argument to support the theory of counting tokens to administer agricultural goods in the Neolithic, by suggesting clay objects appeared to fulfil the new need for advanced accounting, replacing older tally counting systems, which are she claims, restricted in their scope for both abstract counting and accounting, a claim which as illustrated by evidence from Palaeolithic Africa and Europe, medieval Europe and modern ethnographic evidence, simply is not true. Schmandt-Besserat suggests that the archaeological evidence proves the evolution of counting through three systems, from the Palaeolithic dating from 15,000 BC, through the Neolithic period and into the early historic period ending c. 3,000 BC.

Palaeolithic tallies, Schmandt-Besserat suggests, illustrate the earliest form of counting, representing simple one-to-one values in egalitarian, preliterate, hunter gatherer societies. Tallies are the manifestation of the earliest counting, recording counts of time by hunter-gather communities (Schmandt-Besserat 1992a: 166, 167; Schmandt-Besserat 1996: 167-68). Designed specifically for this purpose, tallies, much like the later Neolithic "tokens" are interpreted as reflecting "the culture, economy, and socio-

political system of the people who used them" (Schmandt-Besserat 1992a: 184). Tallies, as a method of information storage are in fact found all over the world, and date from tens of thousands of years before present, into the relatively recent mediaeval period of Europe. Yet Schmandt-Besserat focuses on the use of tallies in the restricted time period of the period of 15,000-10,000 BC (1996: 100; 1992a: 166-67, 170, 188-89). Interpreted as having no counting needs other than the tracking and recording of the passage of time, the many examples of notched bones in the Near East, dating to this time period as presented as examples of such practice. Each notch represents one unit, equating to one sighting of the moon as proposed by Alexander Marshack (1991 & 1985; see discussion of Palaeolithic and medieval tallies later in this chapter) (Schmandt-Besserat 1992a: 166-67, 189; Schmandt-Besserat 1996: 114).

-Neolithic counting & "tokens"

Tokens are proposed as representing the second stage of counting. This innovation still relied on one-to-one correspondence; however clay objects bought the new concepts of "cardinality" and "object specificity" (Schmandt-Besserat 1992a: 189-90; Schmandt-Besserat 1996: 115). Schmandt-Besserat suggests that specific objects symbolised a set unit, which may be a plural, hence one sphere, one cone and one larger cone all represented grain in different measures, yet no evidence for this is presented (Schmandt-Besserat 1992a: 190; Schmandt-Besserat 1996: 115-16). Although clay objects were used in sets, they were still used in a system in which differed from abstract counting (Schmandt-Besserat 1996: 116; Schmandt-Besserat 1992a: 189-90). The fact that the appearance of the "token system" coincided with the appearance of farming, and the number of different clay objects increased with the increase in the range of commodities in circulation, suggests that they were only ever used in direct reference to a set commodity and that abstract numbers and counting preceded concrete counting in the near east (Schmandt-Besserat 1996: 116).

-Three stage process

Schmandt-Besserat claims that linguistics and anthropology in addition to archaeology, support her interpretation of the function of clay objects. She links the three major phases in the development of counting (1) one-to-one correspondence, (2) concrete counting and (3) abstract counting, to major phases in human socio-economic development; (Stage 1) mobile hunter-gatherer communities (Palaeolithic), (Stage 2) early sedentary farming villages (the Neolithic) and (Stage 3) urban settlements (early historic) (Schmandt-Besserat 1992a: 99, 166) . Schmandt-Besserat attests that the

timing of the appearance and evolution of clay objects can also be matched to these three phases, thus supporting her functional interpretation of them. (Stage 1) In the "pre-token" Palaeolithic, people existed, she claims, by practicing reciprocal exchange, thus before the Neolithic, "counting tokens" were not needed. Tallies instead were used to record time. (Stage 2) The early cereal farmers and sheep/goat herders of Neolithic rank society needed a simple range of basic, "plain tokens to count out agricultural produce. (Stage 3) Lastly, Schmandt-Besserat claims that within the highly stratified society of c. 4,000 BC onwards, circulated a large range of processed and manufactured goods. Organised by the state, such complex settlements needed an accordingly "complex" range of "tokens" in order to count, and record their goods Schmandt-Besserat 1992a: 166-72). By default therefore, clay object from their inception, were used as tokens; to count and account produce, in the same fashion all over the Near East from the Neolithic period c. 8,000 BC, until the advent of writing in the urban city-states four thousand years later (Schmandt-Besserat 1996: 103-23; Schmandt-Besserat 1992a: 184).

Symbolic System: writing

In addition to enabling complex counting, and their utilisation in the administration of goods, clay objects, operating as tokens, are attributed to prompting the invention of writing, acting as the precursors of the world's earliest writing system, Schmandt-Besserat claims (1992a, 1992b, 1996). With each different shape of clay object representing a set unit of a specific commodity, clay objects formed a "code", understood across the entire Near East and consistent for millennia (Schmandt-Besserat 1992a: 198). This represented a breakthrough in communication, with hundreds of clay objects symbolising the same repeated meaning. Tokens prove the first script-cuneiform developed from them and can be traced through time from their first appearance down to the start of the third millennium BC where the use of clay objects as tokens declines sharply with the appearance of first a pictographic script which soon led to true writing on clay tablets with a stylus in the Uruk IVa levels c. 3,100-3,000 BC (Schmandt-Besserat 1992a: 142-90, 198). This claim again is largely unsupported by direct evidence from the Neolithic Near East, though evidence related to the form, storage and use of clay objects in conjunction with solid and hollow bullae in the fourth millennium BC to support these claims (as evidenced at Uruk in levels Uruk xviii to vi). Furthermore, Schmandt-Besserat suggests that in the early fourth millennium, a new method of storing clay objects was developed: strings of perforated clay objects and solid bullae (1996: 39) (figure 2.32). Perforated clay objects are

restricted in time and location, being found only in particular sites of Iraq, Iran and Syria, mainly in the fourth millennium BC (found at Habuba Kabira: 118 examples comprising 84% of the clay objects from that site. Uruk has 119 perforated clay objects representing 14.7% of the sites total clay object assemblage, and Susa has 189 representing 27% of the sites total number of clay objects) (Schmandt-Besserat 1996: 39).

Solid bullae have been found at Susa, Habuba Kabira and Chogha Mish (see figure 4.1 for site locations). Dating to the same horizon as perforated clay objects, their relationship to each other is unclear; the two have not been recovered from the same context as each other (Schmandt-Besserat 1996: 40). Despite this, the use of perforated clay objects in conjunction with string and solid bullae is supported by the fact that the greatest number of solid bullae come from Habuba Kabira; the site that according to Schmandt-Besserat "produced the most perforated tokens" (Schmandt-Besserat 1996: 41). Correspondingly no solid bullae have been recovered at Uruk, were perforated tokens were "few" (Schmandt-Besserat 1996: 41). Though Uruk and Habuba Kabira have the same actual number of perforated clay objects, the total clay object count at Uruk is far higher (here perforated clay objects constitute only 14.7% of the site's total clay object assemblage) than at Habuba Kabira (Schmandt-Besserat 1996: 40-42). Schmandt-Besserat over looks this detail.

A second revolutionary form of clay object use occurs according to Schmandt-Besserat c. 3,700-2,600 BC, immediately after the "climax" of "complex token" use, with groups of clay objects kept as archives in spherical or ovoid, hollow clay balls or envelopes (see for example figures 2.1 and 2.35) (Schmandt-Besserat 1992a: 198; Schmandt-Besserat 1996: 42-3). From 3,500 BC, these envelopes are impressed on the outside with the clay objects they contain. The total number of enveloped referred to by Schmandt-Besserat is around 130 complete specimens and an additional 70 fragments (1996: 43). These do not cover the entire area where clay objects are found, 85% come from Iran only (Schmandt-Besserat 1996: 43). In addition, 2 envelopes have been excavated in Habuba Kabira, 3 from Sheikh Hassan, and 25 from Uruk (Schmandt-Besserat 1996: 43). Two have been discovered on the antiquities market claiming to be from Israel. Many of the envelopes contain impressions of the containing clay objects on the outside, and are found in context before flat clay tablets appear (Schmandt-Besserat 1992a: 7). This is used as evidence to demonstrate that eventually, clay objects were deemed unnecessary, with clay object containing bullae being replaced by solid flat

tablets bearing different shaped impression made by clay objects. Eventually, the mark left by impressing clay objects onto tablets was recreated using a stylus; making clay objects altogether redundant (Schmandt-Besserat 1992a: 7). This interpretation does not account form nor explain the continued presence of clay objects, in significant quantities, at a number of sites, used alongside writing, into the 1st millennium cal. BC (clay objects are common at many 2nd and 1st millennium BC Mesopotamian sites such as the 1st millennium Neo-Assyrian site of Tell Tiat where thousands of clay objects were recovered (MacGinnis 2013). The enduring existence of clay objects, for up to three thousand years after the advent of writing, clearly demonstrates writing did not replace clay objects. In fact, this evidence strongly suggests clay objects played a crucial role in administration, complimenting, yet distinct from written records.

Schmandt-Besserat suggests this system developed with the invention of abstract counting, enabling the separation of the item or commodity being counted from the unit or quantity of those items (Schmandt-Besserat 1992a: 7). The two signs on flat clay tablets came to represent different things: the clay object impressions or "impressed signs" represented abstract numbers and the drawings of the clay objects themselves, incised with a stylus, the "incised signs" represented goods or commodities (Schmandt-Besserat 1992a: 7). So for example, five jars of oil could be recorded with one incised oval shape and five impressed wedges. The oval shape represented a three dimensional clay object of ovoid shape (the symbol of oil) and the five wedges the abstract number five. This, Schmandt-Besserat claims proves that cuneiform script in Sumer was developed from three dimensional clay objects and not a pictographic script as was often claimed, but now known to be incorrect (as demonstrated by Falkenstein 1936; Friberg 1994: 478). In this context, writing emerged from the "token" system, which in turn continued the symbolic tradition of Palaeolithic times according to Schmandt-Besserat.

(ii) SCHMANDT-BESSERAT: SUPPORTERS & CRITICS

Early Historic Scholars-The Berlin Group

-Introduction

Schmandt-Besserat's (1992a, 1992b, 1996) ideas have been widely accepted by scholars within the discipline of Near Eastern archaeology, as well as those from related, secondary disciplines; there is however, one exception. The early historic community, represented by the Berlin Group, including Peter Damerow, Robert Englund, Jöran Friberg and Hans Nissen, has been outspoken in its opposition to

Schmandt-Besserat's "token" theory (Brown 1996; Damerow 1993; Englund 1993, 1998; Friberg 1994; Michalowski 1993). The Berlin Group is comprised of linguistic scholars specialising in the origins of writing and counting, and in the study of archaic (proto-cuneiform and proto-Elamite) and early full cuneiform texts (c. mid-late 4th millennium BC into the 3rd millennium). The group has been intensively studying the origins of writing in Sumer and Elam in the latter part of the 4th millennium BC for many years, with the aim of publishing the entire known collection of proto-Sumerian and proto-Elamite clay tablets (Friberg 1992: 482).

As specialists in the origins of writing, and the translation and interpretation of early cuneiform script, the basis for the Berlin Group's critique of Schmandt-Besserat's ideas is distant in time from the temporal focus of this study. Yet as experts in 4th to 3rd millennium BC administration, the group's views on Schmandt-Besserat's ideas plays an important role in reassessing the functioning of "tokens" in the Neolithic. The predominant interpretation of Neolithic clay objects is almost entirely reliant on the perceived secure interpretation of comparable artefacts of the 4th millennium BC onwards, as symbolic administration tools, representing commodity and number, functioning in a set, standardised and universal system across the Near East. If Schmandt-Besserat's views on 4th millennium clay objects as administrative tools, mnemonic aids and the precursors of written script are proved to be questionable, then the entire argument of comparable objects of the Neolithic functioning in a similar way, within the administrative sphere loses all credibility.

-Berlin Group's Critique of Schmandt-Besserat

-Overall reception

Though praising Schmandt-Besserat for tackling such an important and considerable topic (Brown 1996: 42; Englund 1993: 1670; Friberg 1994: 481; Michalowski 1993: 998), the overall evaluation of her work by the Berlin Group has been constructively critical (Brown 1996; Damerow 1993; Englund 1993;, Friberg 1994; Michalowski 1993). The scholars are direct in their overall negative assessment of Schmandt-Besserat's theory, stating that though "much of her argument is appealing" (Englund 1993: 481) and her conclusions present a plausible explanation (Damerow 1993: 33), based on the uncritical use of selective data (Brown 1996: 42; Englund 1933: 1670), her theory is poorly constructed and untested (Damerow 1933). The "painful cracks in her argument" (Friberg 1994: 482) are highlighted, and her misinterpretation of many details of cuneiform and proto-cuneiform script such as the numerical notation system

used in the latter (Michalowski 1993: 998), lead to the consensus of Schmandt-Besserat's 1992b catalogue as "deplorably insubstantial" (Friberg 19974: 481, 486-91. Also Englund 1999: 259). Her work (1992) overall is therefore considered as an unsuccessful, "sprawling and highly speculative piece of research" (Brown 1996: 37, 42).

-"Tokens": definition and ubiquity of function

One major flaw illuminated by the Berlin Group is that Schmandt-Besserat (1992) provides no clear definition of what constitutes a "token", with the classification of some items in the catalogue very questionable (Brown 1996: 38, Englund 1993: 1670; Englund 1999: 258). Indeed, most agree that only those objects found inside, or in conjunction with bullae (which do not appear in the Near East until the mid-4th millennium BC) can definitely be classified as "tokens" (Nissen *et al.* 1992: 12-13). This immediately excludes all Neolithic, and indeed all pre 4th millennium clay objects from the functional designation of "tokens" and the sphere of administrative tools (Englund 1993: 1670, 1671; Englund 1999: 258).

The early historic scholars attack the ubiquitous function suggested by Schmandt-Besserat. Her claim that all manner of small clay and stone objects, from a wide variety of sites from the Neolithic caves of hunter-gatherers, early Neolithic villages of herders and farmers, to the early urban period of the late 4th millennium formed a single, unified and coherent numerical administrative system across such a vast space and time is attacked as unjustified, and a major, implausible assumption; especially when the context of most of the 10,000 or so "tokens" studied by Schmandt-Besserat is unknown (Brown 1996: 38; Englund 1993: 1670; Englund 1999: 258; Friberg 1994: 480-81, 482, 484; Michalowski 1993: 996, 998; Sampson 1985: 57-61). They are unconvinced by the scant supporting evidence presented to support this sweeping statement, highlighting the fact that a significant proportion of the so-called "tokens" come from contexts pointing against an administrative function; the graves of adults and children (Brown 1996: 38; Englund 1993: 1670-71; Englund 1999: 258; Michalowski 1993: 998; Sampson 1985: 57-61).

-Abstract Number and Counting

Perhaps the most opposable element of Schmandt-Besserat's theory is the claim that as counting aids, clay objects as evidenced from the Neolithic period onwards, led to the cognitive development of the ability to conceive of abstract number, followed by

abstract counting (1992a: 191). Schmandt-Besserat uses the presence of numerals on the earliest pictographic tablets of southern Mesopotamia and Elam as proof of this claim. She furthers her argument with the assertion that counting then prompted literacy, evidenced in the rendering of non-number words as seen on the proto-cuneiform texts of Sumer in the latter half of the 4th millennium BC (Schmandt-Besserat 1992a: 191; Friberg 1994: 481; Michalowski 1993: 998). The Berlin Group demonstrate this argument to be incorrect, highlighting Schmandt-Besserat's failure to comprehend the written evidence. Within their research circle, it is well known that the rendering of number signs in the archaic texts of the later part of the 4th millennium BC (both proto-cuneiform and proto-Elamite) was not by use of a single set of abstract numbers (Nissen *at al.* 1993: 134-38). Indeed abstract number as a concept is not evidenced on pictographic tablets or the earliest written documents. There is no evidence of abstract number in the textual evidence of Mesopotamia until the end of the 3rd millennium BC (Brown 1996: 39, Englund 1993: 1671, Friberg 1994: 482, 483, Michalowski 1993: 998, Nissen *at al.*: 134-38).

The Berlin Group explain how Schmandt-Besserat has misconstrued the written evidence. Of the c. 1,200 archaic symbols known, approximately 60 of them represent number. They were used together in groups, with the values of each symbol, and the composition of numerical sets varying according to what was being counted and recorded. There was a specific set of symbols with corresponding values used to, and only to record counts of surface area. When recording a measure of grain, a different set of symbols, some reused, some new were assigned a different set of values. For example, the symbol representing 60 units of land area took on the value of 300 when measuring grain (Nissen *at al.* 1993: 25). Thus during the 4th and most of the 3rd millennium BC, various sets of numerical systems existed, each being context specific (Nissen *at al.* 1993: 25, 131, 134-38).

With this knowledge, it is convincingly argued that is rather incongruous that clay objects should hold a particular, and standardised numerical value (within one village, one region or one discrete area of the Near East), in the later 4th millennium, or at any time earlier to that as Schmandt-Besserat suggests. Indeed, the numerical value of "tokens", if any, is still unknown. The Berlin Group stress that there is no evidence that "simple" or "complex tokens" had set values (Brown 1996: Friberg 1994: 483-84). It is unlikely they ever did, as the numerous signs used to represent numbers on proto-literate clay tablets certainly did not have set values. In this knowledge, the Berlin

Group demonstrate that there is absolutely no evidence that early token shapes were the direct inspiration for proto-literate number signs as claimed (Brown 1996: 38-9; Damerow 1993: 29-31; Damerow 1988; Damerow & Englund 1987; Englund 1993: 1671; Friberg 1994: 482, 484; Michalowski 1993: 998; Sampson 1985: 59).

-Evolution of Symbols Argument

Much of the detailed criticism of the early historic community centres on Schmandt-Besserat's interpretation of the evolution of symbols: the claim that the three dimensional shape of clay objects was replicated in two dimensions by the earliest written signs seen on clay bullae and flat clay tablets in the latter part of the 4th millennium BC. Centring on the transition into writing, this part of Schmandt-Besserat's argument is crucial to her entire thesis regarding the use of "tokens" from the Neolithic onwards c. 8,000 to 3,000 BC. Claimed to be the precursors of written script, Schmandt-Besserat works backwards, attributing an administrative, counting function to the earliest geometric clay objects, those of the Neolithic period; claiming that from the start, clay objects were "tokens". The perceived similarity of "token" shapes in three dimensions, two dimensions and early number signs is not interpreted as proof of a set symbolic system, not in the 4th millennium and certainly not operating from the Neolithic period onwards. As explained above, this seems extremely unlikely in the context of the lack of abstract number. In addition, Friberg (1994) highlights that the most common "token" shapes: spheres, discs and cones are those most easily made by manipulation clay between the fingers and thumb. Equally, the two dimensional impressions made by such objects is limited, and the range of symbols easily made by pressing a round stylus obliquely or at a right angle into wet clay will by sheer coincidence all be similar. There is absolutely no evidence that early token shapes were the direct inspiration for protoliterate number signs (Brown 1996: 38-39; Friberg 1994: 484; Sampson 1985: 59).

There is equal doubt cast by Early Historians on Schmandt-Besserat's claims regarding the origins of archaic word signs. Like numbers, she claims a similarity in appearance of certain three dimensional clay objects and archaic signs for the words of some commodities (for example "sheep" and "oil"). This similarity is used to support the argument that the meaning of "tokens" of certain shapes was constant through time and universal across the Near East, eventually being translated from three dimensional clay objects into script. The argument of an inevitable coincidence in the appearance of some clay objects to some early cuneiform signs is equally valid here (Sampson 1985:

60). Furthermore, the most common, staple commodities such as sheep, barley and wheat would be expected to comprise the bulk of "tokens" recovered, and likewise be found at all sites and this simply is not the case (Brown 1996: 39; Englund 1993: 1671). Schmandt-Besserat does not discuss this matter, however it is clear from the evidence that the so-called "sheep" token, a disc with incised or applied cross is extremely rare archaeologically (figure 2.2 top). A crucial matter which is not explained or even considered (Brown 1996: 39).

-Other Problems

The sweeping generalisations along with numerous additional small errors, inconsistencies and gaps in Schmandt-Besserat's data and argument and analysis combine to cast doubt on the integrity of her overarching theory (Brown 1996; Damerow 1993; Englund 1993, 1998; Friberg 1994; Michalowski 1993; Sampson 1985: 59). Examples include the repeated incorrect use of the term "proto-Sumerian" being used to describe "proto-cuneiform" script, the omission of any data in the catalogue from Habuba Kabira (a site crucial in Schmandt-Besserat's analysis) and incorrect object counts when providing totals and breakdowns by style and attribution some "tokens" from Neolithic Beidha to the 1st millennium BC for example (Brown 1996: 41, 42; Englund 1993: 1670). The hollow clay balls or "bullae" hold the key to her argument in Damerow and England's opinions, yet Schmandt-Besserat appears to have made no attempt to examine these or their containing objects (Damerow 1993: 31-32, Englund 1993: 1670, Englund 1999: 258). Of the 130 known (at 1999) examples, 80 are still intact. Indeed the contents of just 5 were at the time of publication, known with any certainty-an extremely small proportional sample to base an entire thesis on (Englund 1999: 258).

-Summary of Berlin Group's Critique

The arguments presented above serve to highlight the many inconsistencies, assumptions and oversimplifications of the evidence in the work of Schmandt-Besserat. This has profound implications on the interpretation of Neolithic tokens, as almost all work to date is based upon the unfounded theory of Schmandt-Besserat in relation the development of writing from the apparent accounting system developed in the Neolithic by use of clay tokens. If, as the early historic community convincingly argue, many of Schmandt-Besserat's claims regarding the role played by clay objects in the administrative system of the 4th and 3rd millennium BC are unfounded, then the administrative function of similar objects in the Neolithic period needs to be

reassessed, independent of Schmandt-Besserat's theory. The work of researchers within the Berlin Group shows how the concept of abstract number was not represented symbolically in writing until well over one thousand years after the first full cuneiform script was invented, that clay objects did *not* have a standardised and universal numerical value, nor were they the inspiration for the earliest numerical or word signs rendered on clay tablets. These revelations cast into doubt, Schmandt-Besserat's entire theory, which is largely based on evidence from the early historic period of these scholars. Yet the views of those opposing Schmandt-Besserat have failed to permeate the wider archaeological community and those from secondary disciplines. Thus despite the insightful comments and scathing reviews of those who arguably are best placed to comment on any theory on the origins of writing in the Near East, the early historic community is forced to correctly admit that Schmandt-Besserat's work on the topic "has had a profound influence on the way in which we view the origins of writing, and her influence will be felt for years to come" (Michalowski 1993: 998). A statement which continues to be true today, twenty years after her seminal publication.

Broad Acceptance of Schmandt-Besserat's Ideas

As the most prolific writer on the subject of the use of clay objects, most archaeologists and scholars from secondary disciplines simply accept Schmandt-Besserat's work at face value (Bottéro, Herrenschmidt & Vernant 2000, Coulmas 2003, Fischer 2001, Malafouris 2013, Netz 2002). Aside from the early historic community, little constructive criticism of her theories have been published. Instead, the topic of "tokens", their presence and function on Neolithic sites, and those of later, periods is either ignored, or mentioned with reference to Schmandt-Besserat's interpretation-serving to only passively verify her ideas. For example, the recent research paper by Carmona and Ezzamel (2007) states as fact "Mesopotamian scribes assigned clay objects of different shapes to different commodity accounts" (Carmona & Ezzamel 2007: 182, 184), and that their later usage, being impressed onto the outside of clay envelopes, eventually led to the development of the first writing system via the replication of the impressions by the earliest pictographs (Carmona & Ezzamel 2007: 182). Like many, Carmona and Ezzamel hail Schmandt-Besserat and her "pioneering work on the genesis of accounting, counting and writing", with no analysis of her work (Carmona & Ezzamel 2007: 184), taking the lengthy database (Schmandt-Besserat 1992b) as proof of Schmandt-Besserat's interpretative assertions. Where critiqued, most discussion is based not the overarching ideas of her work, but on the actual

mechanics of their use in an accounting system. Few have rejected Schmandt-Besserat's ideas outright in favour of an alternative functional interpretation (Lieberman 1980, Mattessich 1994, Mattessich 2000, Netz 2002, Nilhamn 2002). The majority of scholars therefore seem to agree that her theory is correct, just disagree with the details.

Mattessich (2000)

Mattessich (1994, 2000), for example, is an accounting historian, who has written many articles on the subject of historic and prehistoric accounting systems. He questions whether the "token" and bullae accounting system really did precede the written word. Mattessich also casts doubt on whether a written (cuneiform texts on clay tablets) and a "token"-bullae accounting system really did operate side by side at the end of the 4th millennium BC, and how great an influence clay object accounting was on the creation of writing. Yet the rejection of Schmandt-Besserat's overarching theory; the possibility that clay objects were not tokens, and had an alternative function to accounting tool, is not entertained (Mattessich 2000).

Netz (2002)

Greek numerical practices influenced both the work of Leo Oppenheim (1959, see below) and Schmandt-Besserat in the interpretation of "pebbles", possibly of clay, as "calculi" or counting "tokens". Netz (2002), speaking on the subject of counting and ancient Greek numeracy, supports Schmandt-Besserat's writings, claiming that in most ancient cultures, the writing of abstract numbers appears before words are written. Accordingly, the earliest texts consist purely of lists of numbers due to the needs of early cultures to record numbers as a priority (Netz 2002: 323). "Counters" (defined as "small tokens"), he suggests, were vital to the appearance of numeracy (Netz 2002: 323, 325). Like Schmandt-Besserat, Netz suggests the small geometric clay objects found at Near Eastern sites from the 8th millennium BC onwards were counting tokens, just like the comparative Classical Greek objects. Yet rather than needing to have objects made specifically for the purpose of counting, he suggests that in Greece, everyday items such as pebbles were utilised for the purpose, used on flat abaci made of wood or scratched onto disused roof tiles (Netz 2002: 327). The work of Netz (full theory detailed in section 2.4b below), though in a different location and period to the focus of this study, demonstrates how items similar to the clay objects of the Neolithic Near East, may have been utilised in conjunction with a board, to perform calculations. The calculations have the potential to be very complex, regardless of the design of the counters. A group

of identical calculi have the same ability as an identical, or indeed varied group of geometric shapes, to perform advanced mathematics.

Lieberman (1980)

Lieberman (1980), in his detailed discussion of the use of clay objects and the origins of writing (see below for full theory), presents textual (Sumerian and Akkadian) evidence in support of the use of clay objects as "calculi". Although presented as an alternative argument to Schmandt-Besserat, Lieberman still supports many of her views. He interprets clay objects as administrative counting tools, but unlike Schmandt-Besserat, he has a clear, and restricted classification for his "calculi" as those "objects which were actually used in producing extant impressions on clay bullae…the solid clay spheres and cones" (Lieberman 1980: 341). All other forms of clay object are dismissed as there is no clear evidence for their functioning within the administration system of the 4th and 3rd millennia (Lieberman 1980: 341). Spheres and cones however are proposed as being clear indices and icons. They are signs, yet did not necessarily act within a universal, set system (Lieberman 1980: 341). This promising article challenges the assumptions Schmandt-Besserat makes, however, alternative functions for the objects are not developed.

(iii) OTHER CRITICS:

Aside from academics who debate the intricate details of Schmandt-Besserat's "token" system (accepting the basis of Schmandt-Besserat's argument, or rejecting only small parts of her thesis), additional criticism comes in the form of short literary reviews of her main (1992, 1996). Apparent flaws in Schmandt-Besserat's argument are highlighted, yet the objective is not to present a fully investigated alternative scenario (Dessel 1996, Zimansky 1993). The main criticisms are based around Schmandt-Besserat's perceived similarities between the clay objects and later cuneiform signs, stemming from the assumption of a unified and widely recognised symbolic system centred on the geometric objects (Dessel 1996: 159, Zimansky 1993: 514). A lack of consideration of the differences in the symbolic meaning of clay objects in different time periods and across settlements is often highlighted, as well as a lack of understanding of the culture specific nature of the representation of three dimensional objects in two dimensions (Dessel 1996: 159; Zimansky 1993: 514). The inclusion of a significant (14%) of non-geometric clay objects in the catalogue with no explanation, along with the absence of the clay object assemblage from Habuba Kabira; the site referred to so often in discussion of the clay objects in volume I (Schmandt-Besserat

1992a) are also highlighted as flaws in the argument. Woods' current work (section 2.2 above), though not directly opposing Schmandt-Besserat's theories, presents evidence in stark opposition to it (Woods 2014, Woods 2010).

Jasim & Oates (1986)

An exception to the general acceptance of Schmandt-Besserat's theories is the work of Jasim and Oates (1986). In their investigation of the form, function and sequence of "small clay objects" in Mesopotamia, Jasim and Oates focus on the often neglected period between the appearance of the extensively documented objects in the 8th and 7th millennium BC, and the appearance of writing in the 4th millennium. Temporally located in-between, the 5th and 6th millennia BC are cited as a crucial period in the development in the use of clay objects, exemplified by two well excavated and documented north Mesopotamian sites, Tell Abada and Tell Brak (Jasim & Oates 1986: 362). In this insightful article, it is the editor's introduction that correctly states that Schmandt-Besserat and her supporters make two broad assumptions: firstly that unlike Pierre Amiet (1966), all forms of small clay objects (including figurines and model carts, model houses and so on) are included in the definition of a "token", which no longer restricts her thesis to the areas with specific evidence for *small, geometric* clay object use.

Secondly, Jasim and Oates attack Schmandt-Besserat's writing as having no evidence to "demonstrate the association of different types of small clay objects within any prehistoric system, whatever its economic or social function", that is there is no evidence to link the many different types of objects Schmandt-Besserat claims worked together as part of one system, with set meaning across the entire Near East from their earliest appearance (Jasim & Oates 1986: 351). Although they support her in stating the fact that clearly small, geometric (but not figurines) clay objects were used as "numerical calculi" in the late 4th millennium onwards, they believe it is far from clear whether nor not similar objects performed the same function in earlier times (i.e. in the 8th-5th millennia; Jasim & Oates 1986: 351). The antecedents of the clay object *calculi* system are unclear and not discussed by Schmandt-Besserat with any level of feasible supporting evidence presented, and that from their appearance until the 4th millennium, we still have no idea what the objects were used for, "there was certainly no universal system" (Jasim & Oates 1986: 351).

Using 5th to 4th millennium BC Tepe Gawra as a case-study, Jasim and Oates tackle the question of the role of clay objects in the later prehistoric phase of the Near East. They conclude the context of clay objects at the site suggests the objects were *not* used in accounting there (1986: 352). Tepe Gawra has only a small number of clay objects, found in only one of the many well excavated occupation levels (Jasim & Oates 1986: 351). Their rarity, location within grand graves, and association with other rare, well-crafted items suggests they were deposited as status symbols, "but a status which the objects themselves do not define" (Jasim & Oates 1986: 325). Additionally, Jasim & Oates present evidence from 5th millennium Tell Abada as showing clearly, and for the first time, that different shaped clay objects functioned together, yet the nature of their function is still unclear (Jasim & Oates 1986: 352). Broad excavations (revealing 80% of the village plan over three occupational levels) show that Building A is the only location where clay objects were ever deliberately deposited (1986: 352). The caching of groups of clay objects of all shapes, including cones (some incised), discs, rods and spheres, (see figures 2.33 and 2.34) as well as an incised tally, prove that according to Jasim and Oates, the mutual relevance of the items, but not their function. The function of clay objects at Tell Abada is not assumed to be administrative, and upon lack of any indicating factors as to the role of clay objects here, Jasim and Oates feels it could be religious (as the large, central building contains lots of infant burials) or associated with counting (as lots of the items are stored together in pots) (1986: 355). Although not presenting definitive evidence to contradict Schmandt-Besserat's interpretation of the function of clay objects pre 4th millennium, Jasim and Oates flag up the fact that her interpretations are not supported by the late prehistoric evidence.

MacGinnis (2013)

In a similar vein, MacGinnis (2013) has dismissed Schmandt-Besserat's claim that clay objects were used as recording devices which evolved directly into and were eventually replaced by writing, as completely unsubstantiated. His recent work at the site of Ziyaret Tepe, a Neo-Assyrian (1st millennium BC) provincial capital on the Upper Mesopotamian Tigris River, has uncovered a palace area housing a series administration complexes. Along with caches of cuneiform tablets which record various goods and workers, are hundreds of geometric clay objects. Two thirds of the site's >500 clay objects come from archives within the palace area. One cache alone, located in Room 37, comprised 240 clay objects, likely hung in bags from the ceiling, or stored in groups in an upper story of the room (MacGinnis 2013). The typology of Ziyaret

Tepe's clay objects is described as being reminiscent of the Neolithic "tokens"; mainly spheres, flat discs and tetrahedrons (MacGinnis 2013).

MacGinnis (2013) argues that the caching of Ziyaret Tepe's clay objects, their placement within archives, and the association of clay objects and administrative texts within the archives is clear evidence for the use of clay objects in administration at Ziyaret Tepe. He cites at least three other Neo-Assyrian sites of the 1st millennium BC, as well as multiple Middle Assyrian (2nd Millennium BC) sites in the region which display similar evidence. The continued use of clay objects within accounting activities, long after the advent and widespread adoption of writing, is interpreted as testimony of the clear effectiveness of their function in administration. Their function therefore, must have been a crucial one, and different to that of writing, not one which writing merely replicated and replaced (MacGinnis 2013).Though uncertain of their exact function, MacGinnis poses that clay objects may have acted as a temporary record before being recorded permanently in writing (then kept as a backup record), or perhaps used as tallies in counting to aid the calculations of the administration officials (MacGinnis 2013).

(iv) OTHER INFLUENTIAL SCHOLARS IN THE FIELD OF CLAY OBJECTS & NON-WRITTEN ACCOUNTING IN THE NEAR EAST

Like Schmandt-Besserat's work, most literature discussing the function of clay objects focuses on those from early historic times, the later 4th to 2nd millennium BC, and on their possible use in counting and other administrative activities. Aside from Schmandt-Besserat, the work of Leo Oppenheim and Lieberman has been hugely influential. Despite the fact that clay objects first appear in the archaeological record of the Neolithic, this period is largely ignored. An exception is the work of Trevor Watkins (2012), who has recently investigated the topic of symbolic information storage within Neolithic communities.

Watkins (2012) & "External Symbolic Storage"

Trevor Watkins' "external symbolic storage theory" stems from his re-evaluation of Childe's (1928, 1936) hypothesis on the reasons behind, and the significance of the timing of the "Neolithic Revolution" (term coined by Childe, 1928) in the Near East (i.e. Watkins 2006a: 71, 72; Watkins 2010: 621; Watkins 2012: 38). Watkins' (2004, 2006a, 2006b, 2010, 2012) theoretical discussions on the changes evidenced at the transition from the Epi-Palaeolithic to Neolithic periods, the nature of Near Eastern society, and

the argument that the economic aspects of the "Neolithic Revolution" (see Chapter 3.4) were accompanied by (Watkins 2004: 105), and perhaps even prompted by (2006a: 76; 2006b: 20-21; Watkins 2010: 621; Watkins 2012: 23, 36, 38) a "cognitive and cultural revolution" (Watkins 2004: 105). Though not a study in the function of geometric clay objects in the Neolithic, this research is relevant as Watkins questions not only the cognitive abilities of Neolithic villagers, but their capacity for and need of what he terms "external symbolic storage", devices by which to record information. Geometric clay objects are most commonly interpreted as functioning within this sphere, being used to retain information related to quantity, and also the quantity of a specific commodity from the Neolithic period onwards.

-Neolithic Communities

Watkins defines the essential elements of the "Neolithic Revolution" as the adoption of harvesting, storage and sedentism (Watkins 2004: 105); along with which came an unprecedented effort in the construction of houses, communal buildings including monumental architecture, leading to the construction of entire communities on a never before evidenced scale (Watkins 2006b: 15; Watkins 2010: 631; Watkins 2012: 23). However, Watkins re-enforces the importance of the cultural and cognitive aspects of the "Neolithic Revolution". Indeed, he claims the start of the Neolithic, most commonly characterised as the spread of farming can be understood as "the expansion of a complex way of life that involved communities living together in larger groups, with denser, richer, cultural environments" (Watkins 2006a: 71). These ideas are highly relevant to the discussion of the function of clay objects in the early settled villages communities of the Neolithic period, and Schmandt-Besserat's (1992a, 1992b, 1996) argument that from this period onwards they functioned as symbolic administration devices, a role necessitated at this exact point in time, by the adoption of a sedentary, farming lifestyle.

Watkins continues with the theory that people living in these large, permanent, sedentary communities needed to have certain cognitive abilities in order for such communities and the social networks necessitated by them to be successfully created, and maintained in the long term (Watkins 2006b: 15; Watkins 2012: 36). These cognitive abilities were employed in the construction of various kinds of symbolic artefacts and symbolic practices-creating a shared "culture" which unified and upheld Neolithic communities. These factors, according to Watkins, explain why the "Neolithic Revolution" happened when it did, and not earlier; an evolution of the mind was

"essential if human social groups were to grow in size and permanence beyond the scale of the earlier Palaeolithic" (Watkins 2006a: 71, 72, 76).

-Human cognitive capacity

-Recursive thought

Recursion, "the process of defining a function or calculating a number by the repeated application of an algorithm" is introduced by Watkins as a term used both by mathematicians and linguists (2012: 36). It is the essential characteristic of human languages (Corballis 2011; Watkins 2012: 36). "Recursive thought" claims psychologist Michael Corballis (2011) is fundamental in sustaining identity, the ability of humans to understand complex social worlds around them, and to perform and take part in complex abstract symbolic activities (Watkins 2012: 36). Language is differential; the meanings of the words within a sentence comes from their context in relation to one another, the same as the meaning of the letters within a word, and the words in a sentence (Watkins 2006b: 22). As such, language is a recursive system of symbolic expression and representation; with the words in a sentence conveying more meaning in that set structure, than they would alone, or used in any other order (Watkins 2012: 34, 35-6). The same can be said of writing, as well as collections of aspects of material culture and the built environment (see below).

-Institutional facts

Similarly, from the start of the Neolithic period, people living in larger and sedentary communities, needed the capacity to be able to conceive of and understand what philosopher John Searle (1995, 2010) terms "institutional facts"; abstract concepts such as the 'household', 'neighborhood', 'community', 'marriage', 'private property' and 'money' for example (Watkins 2010: 631; Watkins 2012: 36). These "institutional facts" are crucial to everyday life, and are easily learnt and understood, with little or no formal teaching (2012: 36). The composition, scale and structure of Neolithic society and it's villages suggests Neolithic peoples in the Near East were certainly capable of conceiving of such "institutional facts" (Watkins 2012: 37).

-External symbolic storage

The concepts of "recursive thought" and "intuitional facts" both tie into Donald Merlin's (1991, 1998) "external symbolic storage" theory. This in turn aids in the understanding of the cognitive revolution at the start of the Neolithic, which coincides with the appearance of small geometric clay objects which appear at this time in the Near East

(Watkins 2010: 631; Watkins 2012: 23). The timing of the appearance of both of these things hints at a relationship between the two. Watkins argues that external symbolic representation or storage appeared right at the start of the Neolithic, because it was at this time that humans first developed the cognitive capacity to do so (Watkins 2006b: 15; Watkins 2012: 36). Writing is the best example of external symbolic expression (Watkins 2012: 35-6), yet around 7,000 years earlier than it's development, the first Neolithic communities of the Near East began to use material culture in the same way as language, as a form of external symbolic expression. Material culture was used from the early Neolithic to express and store information (Watkins 2006b: 22).

A diverse array of objects were circulated and exchanged within prehistoric communities (Chapter 3.4, 3.7), many of which had a symbolic rather than intrinsic value (Watkins 2012: 24). Yet these objects were highly valued all the same due to the meaning placed upon them by the community within which they were made and circulated, acting as vehicles of external symbol storage. Buildings too can be expressions of external symbolic storage. A Church for example, has an intrinsic value and symbolic meaning, not due to the structure alone, but it's size, shape, internal decorative elements such as the stained glass windows and imagery on them (Watkins 2012: 34). All elements of a Church combine to create not just a building, but a symbol of Christianity and an entire faith system and would lose their meaning if taken alone (Watkins 2012: 34). This reflects the use of recursive thought The same can be said of Neolithic architecture: the built environment of the Neolithic symbolised and expressed abstract ideas related to the structure of the community, and the relationship of the community within the surrounding world (Watkins 2006b: 22). This was articulated in the structure themselves, their decoration, fixtures and fittings, as well as their placement within the village, their size, visibility and relationship to other structures (Watkins 2006b: 22; Watkins 2012: 34). The structures at Göbekli Tepe, with monolithic carved pillars is a prime example (see Chapter 3 for full details). Within the built environment of the Neolithic village, architecture took on abstract concepts ("institutional facts"), emerging as establishments such as the "home", the "household" and "community" (Watkins 2012: 36, 37). These "nested networks of social relations (Watkins 2012: 36) required maintenance in the form of performance, ritual and ceremony. These actions formed a collective memory, aiding in community cohesion (Watkins 2012: 36). Material culture was necessary, utilised to convey symbolic messages. Thus from the start of the Neolithic in the Near East, material culture was an

important form of external symbol storage, linked to the development of a cultural identity and collective memory.

-External symbolic storage & geometric clay objects in the Neolithic

The ideas expressed by Watkins can be applied to the assemblages of geometric clay objects characteristic of settlements of the Neolithic period in the Near East. The crude appearance of these artefacts and the prevalence of clay within the region, does not necessarily detract from the value people placed on these items, especially if the theory of external symbolic storage is applied. Using Watkin's theoretical perspective of Neolithic communities and cognitive abilities, clay objects of the Neolithic have the potential to have functioned in a multitude of ways, as they could have been given an infinite array of symbolic meanings, different perhaps within each community or sub set of it.

The concept of external symbolic storage does however, also support some aspects of Schmandt-Besserat's (1992a, 1996) claims related to the function of clay objects in Neolithic and later communities of the Near East. Watkins (2012) claims that modern humans could only conceive of symbolic storage at the start of the Neolithic, the time when a "cognitive revolution" supported the transition into this time period (Watkins 2012: 23). Likewise timing is important to Schmandt-Besserat's argument that clay objects appear in the Neolithic, coinciding with the first appearance of farming, as they were used in the accounting of agricultural produce which first appearance in the Near East at this time. Schmandt-Besserat claims that "tokens", from the start, were used not just to count, but acted as symbolic information storage devices, in the same way that written words convey meaning as the symbolic conveyors of language.

Therefore Watkins inadvertently supports Schmandt-Besserat's theory of the functioning of clay objects from the Neolithic, into the 4th and 3rd millennium BC and beyond as his research suggests that it was at the start of the Neolithic, and only from this point in time onwards, that humans in the Near East had a) the cognitive capacity to use recursive thought, b) understand and apply institutional facts, c) thus use material culture and the built environment around them as forms of external symbolic storage in systems understood by the community, serving to unify and maintain groups via the creation of a collective memory. Though Schmandt-Besserat's own theoretic discussions focus on the later, proto-literate and literate times of the later 4th millennium BC onwards (1992a, 1996, reflecting the bulk of her evidence base in

1992b), and she presents no convincing evidence I support of her theory, Watkins' research shows that humans certainly were capable of conceiving of, and using simple clay objects of different geometric shapes as mnemonic aids within a set symbolic system in the Neolithic period.

Leo Oppenheim (1959)

Schmandt-Besserat's argument is heavily influenced by the work of Leo Oppenheim (Oriental Institute of the University of Chicago) regarding the 2nd millennium site of Yorghan Tepe, ancient Nuzi (1959). Leo Oppenheim's interpretation of non-literate accounting systems in the Near East centres on the discussion of Text 449, a cuneiform administrative text published in the Harvard Semitic Series volume XVI (Leo Oppenheim 1959). The "text" is in fact a clay envelope or "bulla", referred to as an "egg-shaped tablet", largely intact and with detailed markings on the outer surface (figure 2.35) (Leo Oppenheim 1959: 123). Upon excavation, it contained 48 items recorded as "little stones" (Leo Oppenheim 1959: 122-23). The outer surface of the bulla records 8 lines of cuneiform inscription (see below) and a seal impression (not published). The text, when translated, was found to be a count of 48 animals, along with details of their age, sex and reproductive maturity (Leo Oppenheim 1959: 124). With the number of animals in the inscription exactly matching the number of "stones" contained inside the "egg-shaped tablet", Leo Oppenheim is certain the artefact is administrative in function (Leo Oppenheim 1959: 123). Notably, the text opens with the line "Stones [referring] to sheep and goats…". The Akkadian word *abnu* being translated as "stone", therefore describing the containing items as mere pebbles, as opposed to referring to them with a functional label such as "token" or "counter" (Leo Oppenheim 1959: 124).

Leo Oppenheim presents the "egg" and "stones" as "some kind of operational device for bureaucratic purposes" making use of the pebbles as "counters, markers, or something of the sort" (Leo Oppenheim 1959: 123). Hailed as "the Rosetta Stone of the token [accounting] system" (Schmandt-Besserat 1992a: 9), Leo Oppenheim's account of the Nuzi objects has been hugely important in the field of non-literate accounting systems of the ancient Near East and is one of the earliest full discussions of bullae and the small objects contained within them. Evidence presented regarding the function of the bullae and "stones" is relied on by Schmandt-Besserat. Although convincing, Leo Oppenheim's interpretation of the Nuzi egg and stones does not prove the operation of a system like it existed either outside of Nuzi, or in earlier times. However the theory is taken by

Schmandt-Besserat and applied to the function of all small clay objects, across the entire Near East, from the 8th millennium onwards.

-Interpretation of the Nuzi Device

Various scenarios for the use of the Nuzi bulla and "pebbles" in counting and accounting are considered in detail by Leo Oppenheim (1959). Although the shape and raw material of the actual objects contained inside the bulla remain unknown (not recorded and lost upon excavation), Leo Oppenheim's preferred interpretation, assumes an identical shape, size and colour of the enclosed "stones" or pebbles. This is arguably misguided, as Leo Oppenheim states "one would, for instance, expect salient differences in the appearance or sizes of the stones, so as to communicate the nature age brackets, sex and other economically relevant features of the animals… one has to assume that the necessarily obvious differences in form, colour or size would hardly have escaped the attention of the archaeologist who found them or any other scholar handling these objects. We thus have to proceed in our investigation under the assumption that the pebbles were uniform and functioned solely as counters" (Leo Oppenheim 1959: 124).

As Leo Oppenheim's assessment of how the bullae and "stones" functioned together is based upon his assumption of the identical nature of the contained objects; he suggests they must have functioned purely as counting aids, rather than transmitting any additional information alongside their counting function. The information on the outside of the envelope refers to 48 different types of animal, as the stones are all identical, they could not have been used to record the different types of animal as listed in the text (Leo Oppenheim 1959: 124). However, as the egg-shaped tablet and accompanying pebbles are unique for Nuzi, Leo Oppenheim feels this remarkable aspect must be reflected in their function. If the bulla and pebbles were used in a very simple way, and to count and keep track of common farm animals in every day transactions, surely there would be such items in abundance?

To explain the uniqueness of the bullae and stones in the Mesopotamian archaeological record of the 2nd millennium BC, as understood in the 1950's, Leo Oppenheim suggests that the containing stones may have been most commonly used without the accompanying, inscribed clay bulla; instead being stored in cloth or leather bags lost to the archaeological record (Leo Oppenheim 1959: 124). If the pebbles stored inside were indeed plain and uninteresting to the eye, Leo Oppenheim feels it is quite likely

that small collections of these would have been missed or ignored on site (1959: 124). This possibility is interesting, as it suggests a development from the use of collections of the pebbles alone, to a more complex administrative system, utilising the pebbles in the same way (to count and keep a count of animals or other commodities), but with additional information being carried via writing on the container of the pebbles, the clay envelope. Yet Leo Oppenheim is hesitant with this theory, as he feels the inscription on the outer surface of the bulla was as important to the system as the pebbles themselves. Furthermore, a secure knowledge of the number of animals would have been insufficient without the accompanying record detailing the species, age, sex, pregnancy state and so on of the livestock in question. Without this information, a shepherd could easily substitute a more economically valuable animal for an inferior one. However, this bulla-text and pebble system attested at 2nd millennium BC Nuzi mirrors the use of wooden tally sticks in use from medieval to 19th century Europe (discussed later in this chapter), where simple notches conveyed basic numerical information in addition to written details on the side of the sticks to record additional and more complex data.

Leo Oppenheim suggests another possible use of the Nuzi "pebbles" is as simple counters, as seen in later Classical counting boards; utilised for basic maths in various spheres of life (Leo Oppenheim 1959: 124). Similar calculi may have been used in the Near East for basic addition and subtraction, thus explaining the presence of the pebbles inside the bulla (Leo Oppenheim 1959: 124). However, if that was the case, there would have been no need to place the pebbles inside the bulla, nor to seal the clay envelope. Yet, even if the "stones" were "counters" only, performing a purely mathematical, and non-symbolic function, the identical pebbles could have acted as part of a more complex system recording the deposition, transferal and, removal of animals of specific age brackets, sexes, and breeds (Leo Oppenheim 1959: 124, 126).

The third functional interpretation proposed by Leo Oppenheim centres around the use of the word *abnu* or "stone" at the start of the inscription. This word also appears on many other economic texts from Nuzi, including lists of animals (Leo Oppenheim 1959: 125). He presents evidence to suggest the use of the word always refers to stones in the plural, and in phrases referring to the active use of the stones in various activities (Leo Oppenheim 1959: 125). Many texts speak of stones and animals simultaneously being "deposited" in, "transferred" to and "taken out" of; strong evidence for the use of the "stones" being used as counters to keep track of animals at Nuzi (Leo Oppenheim 1959:

125). This plausible explanation for the presence of pebbles, and their function in addition to written records is plausible, as it would be far easier for officials (including illiterate officials) to keep track of animal numbers by quickly checking their count against the number of stones or pebbles present, rather than having to trawl through textual records, detailing a number of individual transactions since the last stock take. Like the use of pebbles in the West African Kingdom of Dahomey (section 2.4b below), Leo Oppenheim suggests that each pebble at Nuzi stood for an animal, and that the pebbles followed the animals being deposited in a particular place or locality when an animal was moved, thus the number of animals present would mirror the number of pebbles present at all times (Leo Oppenheim 1959: 125). For stock takes and frequent spot checks, pebbles rather than textual records would be preferable, even though they only held limited information compared to written records (Leo Oppenheim 1959: 125).

Leo Oppenheim's 1959 work is important in it's own right. Is it also useful in advancing possible functions of clay objects in the Neolithic period. All options proposed by Leo Oppenheim are very plausible for 2nd millennium BC Nuzi. The range of functional interpretations could easily increase to many more scenarios of use within the sphere of administration, if the objects inside the bulla had in fact have been different from one another. Leo Oppenheim's discussion is also useful in the fact that it highlights the lack of Schmandt-Besserat to provide a detailed illustration of exactly how she proposes her "plain tokens" functioned in counting and accounting in prehistoric times. Lastly, the presence of a number of probable administration systems at Nuzi, each using small objects, texts and a bulla is not evidence of the same system being on operation in other 2nd millennium, or indeed earlier sites in the Near East. Leo Oppenheim does not imply this, however, many of Schmandt-Besserat's ideas as expressed in her writings (1992-1996) appear to have drawn inspiration from Leo Oppenheim's 1959 work, applying its findings directly to the earliest use of clay objects some 6,000 or more years earlier.

Lieberman (1980)

Lieberman, in his research into Sumerian *Clay Pebbles, Hollow Clay Balls, and Writing* (1980) rejects the early work of Schmandt-Besserat and others who claim "tokens" are the antecedents of writing. Lieberman argues this interpretation is unjustified due to chronological and geographic errors in the classification of "tokens", and the fact that such interpretative claims are made purely on formal comparisons of so-called "tokens", regardless of other information (Lieberman 1980: 339). He criticises

Schmandt-Besserat's interpretation of the work of Pierre Amiet (1966), who did just that. Amiet (1966) hypothesised that in the earliest, 4th millennium bullae of the Near East were used for record keeping, using evidence from two thousand years later. Amiet took the existence of Nuzi text No. 449 (Leo Oppenheim's 1959 "egg-shaped tablet") as evidence to support his interpretation (Lieberman 1980: 339).

Another contention of Lieberman is the interpretation of the word *abnati* (singular: *abnu*) being used to classify all small clay objects as "accounting tokens". The word *abnati* ("stones") is commonly used in texts within, yet crucially not attested outside of Nuzi, therefore this vital piece of evidence supporting Leo Oppenheim's claims for the use of small pebble-like objects at Nuzi, cannot be transferred outside of that site and time period (Lieberman 1980: 340). Rather than classify all small objects, clay and stone, regardless of shape as counting "tokens", Lieberman reserves the use of his preferred term "calculi" for objects that were actually used to produce impressions on the outer surface of bullae, thus unequivocally used in conjunction with bullae, namely the solid clay spheres and cones only (Lieberman 1980: 340-41). The term "calculi" Lieberman suggests, infers items used as a sign or symbol, and there is no evidence of this use of small objects in Sumer, except for in the case of clay spheres and cones (Lieberman 1980: 340-41).

Looking directly at evidence from the time period in question, Lieberman focuses his research on the presence and functional relationship of small clay objects, bullae and writing to 4th and 3rd millennium BC south Mesopotamia (Lieberman 1980). "Calculi" (defined as small clay cones and spheres) are interpreted unquestionably as functioning at this time, as "signs within a system"; represented on the outer surface of sealed bullae as "indices of the calculi inside" (Lieberman 1980: 341). Like Schmandt-Besserat, Lieberman feels the storage of clay cones and spheres inside sealed bullae, in combination with their impressions on the outside of the same bullae, proves the calculi were clearly signs, and their inclusion together within single bullae shows that calculi impression on bullae and the calculi themselves were signs within a single system (Lieberman 1980: 341). However, he feels this functional interpretation cannot be extended to all other small clay objects, stating that although "at least some of them are clearly indices and icons", there is no proof for other shaped objects, that they were "a group of signs within a system" (Lieberman 1980: 341). Like Leo Oppenheim, Lieberman extends his hypothesis only to the time, place and objects that have direct evidence relating to their use. Many additional (non-cone or spherical shaped) clay

objects are clearly not calculi according to Lieberman's definition, and as such had alternative uses (Lieberman 1980: 341).

Returning to the textual evidence, although the term for "stones" found at Nuzi is unique to that location, Sumerian texts speak of *imna*, literally "stone(s)" or "clay stone", suggesting a convention of using the term "stone" to refer to both small objects of clay and stone (Lieberman 1980: 341-42). Pebbles therefore, may have been the primary calculi used in conjunction with bullae, yet could have also been substituted for clay as it was more malleable. Indeed, Lieberman suggests that initially, stones were likely used as calculi, stored in the earliest, 4th millennium BC bullae. However as caches of small stone are not reported in early excavation reports of 4th millennium south Mesopotamian sites, like the Nuzi examples it is likely excavators failed to notice their presence (Lieberman 1980: 342). Lieberman proposes that over time, small clay objects gradually replaced the stones sealed inside bullae, as they enabled the creation of "stones" of different shapes (cones as well as spheres) and sizes, enabling their users to not just count and keeping track of the number of animals and other commodities, but also for distinctions to be made between exactly what was being counted (Lieberman 1980: 342). The same could have been done with stones by careful selection of them by colour, size and shape, yet with clay this was much easier (Lieberman 1980: 342).

As clay became more widespread in its use to create counters or calculi, Lieberman advances that counting and recording thus became more complex, as different size and shaped pieces represented not different units of specific commodities (as Schmandt-Besserat exclaims with the change from "simple" to "complex tokens" c. 4,000 BC), but differences between counters represented different numbers (Lieberman 1980: 342). Like the use of calculi on an abacus in classical times, the location of a clay calculus when counting could represent different numbers, as well as the relative size of the calculi (Lieberman 1980: 342). This theory is suggests that as clay calculi impressions on bullae "seem to have used 'size-value'", with two distinct shaped impressions, cones and spheres present in various sizes (Lieberman 1980: 342). As writing became widespread, calculi continued to be used alongside textual records with the original function of calculi reflected in the symbolic use of "place-value" on clay tablets, with larger numbers written on the top left of tablets, graduating down to the smallest numbers on the bottom right corner (Lieberman 1980: 342). Lieberman's' work clearly agrees with some aspects of Schmandt-Besserat's thesis, yet rather than taking her

work at face value, like so many other linguists, he goes back to the primary evidence, taking on only the aspects of her thesis that can be fully substantiated by the primary evidence, and refuting all other claims. He develops a well thought out, well substantial scenario of the simultaneous use and development of clay bullae, writing and small stone and clay items, incorporating a wide body of evidence, yet crucially evidence from the immediate time period and region in question.

2.4(b) – ACCOUNTING IN OTHER REGIONS & TIME PERIODS

Exactly how clay objects might have functioned within the sphere of administration in prehistoric and early historic communities is debated. Yet as demonstrated above, the use of small geometric-shaped clay objects as tools to aid in the accounting of subsistence goods within Neolithic agricultural communities is the most common interpretation of their function, as proposed by archaeologists (mainly as the result of the dominance of Schmandt-Besserat's thinking on the topic). A number of examples of accounting from outside of the Near East are presented below, as a way to challenge the plausibility of the dominant interpretative scenario, and to suggest new ways in which exactly how Neolithic clay objects might have been useful within Neolithic communities. The examples highlight the range of methods by which a set of identical, similar or dissimilar small objects can be used together; in order to perform simple counts, complex mathematics, record numerical information, or to store more intricate information within the realm of accounting and administration.

(i) ANCIENT GREECE-COUNTING

Netz (2002), in his discussion of counting tools in classical Greece, stresses the importance of the evolution and use of numerical skill. Not just within mathematics, but social, political and economic history (Netz 2002: 321). In this context, the ideas posited in this paper are highly relevant to the use of Neolithic clay objects, if they were indeed used as counting tokens, in the Near East. "Counters", defined as "small tokens", were utilised within a clear set of cultural activities: "counter culture" as he defines it (Netz 2002: 324). Netz argues that counter culture acted to increase and spread numeracy across society, a development which in turn, served to drive literacy (Netz 2002: 324). In early Greece, numbers were used to perform calculations, for calculations sake; yet more commonly, they also acted as representations of things, such as in economic exchange (Netz 2002: 325).

Textual and iconographic evidence makes it clear that in classical Greece, calculations were often made by moving counters on a surface, the abacus (Netz 2002: 325). Unlike the complex *Eastern Abacus*, most common today (involving the horizontal movement of beads suspended on wires or string), ancient Greeks used the simpler *Western Abacus.* This instrument, consisting of a flat board, onto which lines are marked, creating squares onto which counters of whatever shape or material can be placed (Netz 2002: 326). The squares are labelled with set values, allowing the counters to be placed as required, or left blank for the user to assign them values on an *ad hoc* basis (Netz 2002: 326). Only a handful of such abacus boards have been recovered archaeologically, and intriguingly, no definitive examples of counters have been found; suggesting pebbles or other basic, utilitarian, perhaps multifunctional objects were used as counters (Netz 2002: 326).

Netz suggests the use of counters in Classical Greece were crucial to its numerical development. Just as today when we see the Hindu-Arabic numerals (0, 1, 2, 3… to 9, and combinations of) we instantly recognise the symbols on paper as concrete numbers, Netz explains that in ancient Greece, numbers were imagined "as an entity grasped between the thumb and finger" in the form of a portable object, the "counting token" (2002: 329). Although Netz does not apply his counter-culture theory to the Neolithic Near East, he does remark on the theory of Schmandt-Besserat, stating that it is probable that the small clay objects often found in the Near East from 8,000 BC may have acted as "counters", but that it is highly *im*probable that they all had as shared meaning, across the entire Near East, and from 8,000-3,000 BC (Netz 2002: 344). Accepting the simple Neolithic "counting token" element of Schmandt-Besserat's theory, Nets suggests that the Greek counter-culture was descended from the similar Near Eastern counter-culture; however it might have worked in practice (Netz 2002: 344). Netz's research opens up interpretations of the functioning of Neolithic clay objects within the accounting sphere in the Near East. Rather than acting as counting aids in one-to-one correspondence, with each object representing a single or larger number of a certain commodity as proposed by Leo Oppenheim (1959) and Lieberman (1980), Netz's work demonstrates they had the capacity to have been used in a more complex way, to perform calculations on an abacus board of some type, simply marked onto the sand or mud floor.

(ii) DAHOMEY, WEST AFRICA-CENSUS RECORDS

A similarly advanced utilisation of simple, identical small objects is evidence by the ethno-historical evidence from the Kingdom of Dahomey, an extensive and successful state whose history spans 300 years, from AD 1600 until French conquest in AD 1900 (Herskovits 1932). Located in West Africa (covering the modern nations of Ghana, Togo, Benin and Nigeria), traveller's accounts of the Dahomean administration system date from the 17th to 19th centuries AD (Herskovits 1932: 252). The Dahomean Kingdom was tightly controlled by the king and the state, with an extremely efficient system of governance regulating the payment of taxes, as well as the movement of people, animals and goods from one province to another through the numerous provincial customs houses (Herskovits 1932: 252). Accounts speak of the very simple set of administrative tools which were employed for the purpose of recording births, deaths and population counts, including non-numerical data such as the sex of the large living population, the manner of death, and the individual ages of all citizens under the age of 14 years (Herskovits 1932: 252). Administrators in each province collected census information on a regular basis, bringing their information to the king annually to be was collated in the palace (Herskovits 1932: 358). Simple pebbles, baskets, boxes and bags were used for this purpose.

Each Dahomean province had an administration house containing separate rooms to store information related to births and deaths. Births were recorded yearly via the use of pebbles. Pebbles representing each child were stored in a case according to their age and sex (Herskovits 1932: 252). The case consisted of a large box, subdivided into two rows of smaller boxes; one row for males and another for females. Each column of two boxes (male and female) represented a year, thus at the end of the year, all pebbles in the first column representing new-borns, were moved across one row, into the section representing 1 year olds. The rows continued year by year, up to fourteen years, allowing new births for the following year to be placed into the new-born boxes by sex. After the fourteenth year, the pebbles were transferred into the adult boxes, one for males and another for females. If a person died, a pebble would be removed from the box representing their age and sex at death, and then moved into a separate room recording death, being placed into a box or sack according to their age, sex and manner of death (Herskovits 1932: 258).

In addition to information being transmitted via the location of pebbles, colours and symbols were also used; especially at the end of the year when all boxes of pebbles

were bought to the capital to be collated in the yearly count (Herskovits 1932: 260-61). Pebbles were transported to the capital's palace, thus the information related to the location of boxes was lost. Replaced by colours or symbols, pebbles of the deceased were transported in sacks, with black sacks holding the stones of men who had died in battle, red sacks holding deaths from illness and white sacks holding stones representing deceased captives (Herskovits 1932: 260). For the living population, the box compartments holding the stones of adult males had an image of the traditional male trunks sewn onto the side. Adult women were symbolised by beads and the ages of children in years were indicated by the corresponding number of stripes present in the box compartment (Herskovits 1932: 261). The separate counts of each province were placed into large baskets with symbols representing the district (such as a pot for Zumi district; a clay making region) so as to avoid confusion when presenting the data to the king (Herskovits 1932: 255, 55, 60). The evidence from the Kingdom of Dahomey illustrates how simple, identical objects can be used to collect and store large amounts of complex information, numerical and otherwise, in an easily managed system. The system demonstrates that clay objects, as Schmandt-Besserat claims, certainly have the capacity to have symbolised specific numbers, units of numbers, words (i.e. commodities) or both.

2.4(c)-THE PRECURSORS OF WRITING?

The small geometric clay objects of the Neolithic Near East onwards are claimed to symbolise specific goods, and to be the direct precursors of writing (Schmandt-Besserat 1996, 1992). The shape, along with the size and decorative elaboration of "complex tokens" c. 4000 BC onwards it is claimed, represented a specific quantity, and/or commodity. As such, clay objects held, maintained and could transmit detailed information. This aspect of Schmandt-Besserat's theory is widely accepted, however the additional claim that the earliest written numerical symbols, those incised onto archaic clay tablets in the latter half of the 4th millennium BC in the Near East were symbolic representations of clay objects, carrying the same meaning as the three dimensional objects they imitate is more contentious. This second part of Schmandt-Besserat's argument is also unattested by current evidence of the earliest written pictograms, archaic symbols and full cuneiform symbols (found at Uruk and Susa, see section 2.4b ii above). Writing is complex, capable of holding information as a permanent record; information related to any topic, and in any format from simple counts and totals, to extended literally prose. The historic example of census recording above highlights how with the addition of containers, the colour coding of them, and

their placement in specific rooms and locations, plain, identical pebbles were able to record and maintain large quantities of complex information. Similarly, the summary of prehistoric notation systems which follows highlights the ability of simple sets of objects, such as Neolithic clay objects, to retain information. This information could then be "read", verified at a later point in time, even by a different person, from a different settlement.

TALLIES

The aim of almost all known, non-written notation systems appears to have been to record simple numbers, counts and calculations. Tallies are widely recognised as the earliest counting aid, which in addition to calculation, had the capacity to immortalise the information they held. Created by applying notches onto an object or surface, they could be portable, thus transmit information to an infinite audience. Yet due to their form, tallies are limited in the quantity of information they could hold, and the maximum number that can be reached. Before their creation, and likely, alongside tally systems, simple, unassuming, small portable objects may have been used to aid counting, in one-to-one correspondence (i.e. pebbles or sticks). Yet whilst for example twenty people present at an event could be counted by placing twenty sticks, one by one, onto a pile, the sticks would not be capable of forming a permanent record; once moved from position, the record would be lost.

The discussion of tallies forms an integral part of Schmandt-Besserat's argument with important implications for the later introduction and use of clay objects in the Neolithic. Palaeolithic tallies are presented by Schmandt-Besserat as the first of "three stages of data processing": tallies to record time, clay objects to record agricultural produce, and pictographic tablets evolving into full writing to record information related to the full range of manufactured goods (Schmandt-Besserat 1992a: 166-67). As one system falls out of use due to the lack of need, it is replaced by another Schmandt-Besserat argues. However, on closer analysis of the appearance, distribution and use of tallies, it is clear that their distribution in both space and time, along with their functional use is far more complex than Schmandt-Besserat claims. She also assumes that hunter-gatherers in the Near East and elsewhere only needed to record time, using lunar notations to plan events and gatherings (Schmandt-Besserat 1992a: 167); claiming that as they shared produce in reciprocal face-to-face exchange, and had resources in abundance, they had no need for counting or recording their resources. Schmandt-Besserat's claims regarding the use of tokens when they first appear in the

Neolithic, supposedly due to the needs of the first farmers to record their produce, are inexorably linked to her claims that pre-Neolithic hunter-gatherer communities did not have these needs, and only recorded time as seen in their tallies. This is not supported by archaeological or ethnographic evidence. Furthermore, an examination of tallies highlights that to the contrary, seemingly basic systems and objects are capable of recording very complex information. This brief survey also highlights the diverse nature of tally use, valued by a wide variety of peoples and communities practicing a range of subsistence strategies and lifeway's; literate and non-literate, mobile and sedentary, settled farmers, hunter-gatherers, urban and rural. Thus an entire section of Schmandt-Besserat's thesis is immediately discredited by this discussion.

(i) Early Tallies

Tallies, largely defined as a stick or other surface, onto which notches or simple marks are made to keep count of something, have been found all over the world, from the Middle Palaeolithic to modern times (Henshilwood, d' Errico & Watts 2009; Robinson 2007: 54; d'Errico *et al.* 2003: 4-6, fig. 2 p. 5, pp. 31-33). They are indeed often thought to refer to the recording of lunar notations, acting as calendars, but are also commonly used to record transactions and commodities. Tallies are found in many regions and time periods. They were not necessary replaced by the introduction of writing, nor is their use always restricted to the simple recording of counts. Arguably the earliest tally is the Blombos Ochre (figure 2.36), thought to be 77,000 years old (Sy & Tinker 2006: 110). On close observation, this Middle Palaeolithic ochre slab has been clearly smoothed down on one side, on top of this was carved a cross hatching pattern, deliberately created with a point, rather than a knife or other cutting tool. A number of other pieces of ochre with similar patterns, have also been found in the Blombos Cave, at the southern tip of Africa (Henshilwood, d' Errico & Watts 2009; d'Errico *et al.* 2003: 4, 6, 31). Henshilwood believes that a "fundamental turning point in the evolution of human cognitive abilities and cultural transmission was when humans were first able to store concepts with the aid of material symbols and to anchor or even locate memory outside the individual brain" and that the Blombos Ochre along with the other engraved ochres from Blombos Cave represent " the earliest manifestations of this ability, on which all human cultures are based" (d'Errico *et al.* 2003: 31). Exactly what these finds recorded is uncertain, but they prove that from very early on in the prehistory of man, there was the ability to record thoughts in an abstract form. Indeed Sy and Tinker (2006) go as far as to suggest that the Blombos Ochre was a primitive tally count (2006: 110). Tallies increase in frequency and distribution during the

Palaeolithic, being found all across Europe as well as Africa in the Upper Palaeolithic. One example, dated to 20'000 years ago is the Ishango Bone. This central African tally (modern Democratic Republic of Congo), with its "sophisticated mathematical markings", is often interpreted as demonstrating the development from a simple to a complex tally accounting system (figure 2.37) (Sy & Tinker 2006: 106).

The Blombos Ochre and the Ishango Bone are just two examples of Palaeolithic tallies. Their existence demonstrates that hunter-gatherers were capable of, and had the necessity to record things more complex than lunar cycles. The Ishango Bone's markings have been interpreted as an advanced, early recording system-with each set of notches representing a number (Sy & Tinker 2006: 114). Detailed mathematical analysis of the three rows of notches shows an advanced mathematical understanding far more advanced than Schmandt-Besserat credits Neolithic peoples of the Near East in her discussion of counting (Sy & Tinker 2006: 115). According to Sy and Tinker, the Ishango Bone demonstrates an understanding of a base 10 number system, like ours today, as well as a recognition of prime numbers and an understanding of "the importance (for reproduction) of the lunar calendar" (2006: 115). Far removed from Schmandt-Besserat's simplification of the numerical abilities of pre Neolithic peoples of the Near East, as well as their lack of need to record anything but moon sightings, Palaeolithic evidence from Africa suggests that from these early times, people used tallies to keep records of their activities, and to record quantities of subsistence goods (perhaps evening detailing the nature of the specific item). Goods were obtained not only by hunting and gathering, but also exchange, capture, distribution; and later agriculture and production (Sy & Tinker 2006: 116). Non-subsistence goods and materials were also acquired, thus far from leading simple lives, surviving hand to mouth collecting any resources they came across, Sy and Tinker suggest these early, highly mobile Palaeolithic people were intelligent, keeping track of produce in order to sustain the lives of themselves, their families and the tribe (2006: 116).

(ii) Complex Tallies

Tallies are found in many regions of the world. Aside from Africa, numerous examples have been recorded from Palaeolithic Europe, such as the engraved eagle bones from La Placard (near Charente, Western France). These bones, dated to the Upper Palaeolithic c. 13,500 BC, exhibit a series of neat notches, interpreted as recording the lunar cycle (figure 2.39) (Robinson 2007: 54). Similarly engraved bone and ivory sticks from Upper Palaeolithic Europe have been recovered and analysed by Alexander

Marshack (1991). Twenty years of analysis of the Tai Plaque, an engraved rib bone discovered in 1969 in the Grotte du Tai (Aquitaine Region of southwest France) has led to the conclusion that "the notations represent a cognitive form of visual problem-solving and structuring" (Marshack 1991: 25). Compositional analysis suggests the bone recorded non-arithmical observations of the lunar year, and probably also solstitial observations (figure 2.40).

A comparative six-sided calendar stick from eastern Siberia, dated to the eighteenth century AD appears to have had a near identical function (figure 2.41) (Marshack 1991: 32-33). Made from ivory, the stick is hexagonal in section, measuring 17.8 cm long by 2.6 cm wide. It's six faces are each divided into two, creating twelve surfaces onto which intricate carvings were made in rows (figure 2.41) (Marshack 1991: 23-33). Belonging to the reindeer herding Yakut, the stick functioned as a complex calendar, recording in detail, each of the twelve months individually on it's twelve surfaces (Marshack 1991: 32). Within each month's section, are drawings or pictograms of indigenous seasonal events, tribal festival days, and Russian Orthodox holidays and saints days, thus this tally records time, yet in complex fashion, noting much more than mere sightings of the moon (Marshack 1991: 32). A similarly complex astronomical calendar belonging to the Winnebago Indians of modern Wisconsin, USA, dating to the early 19th century AD supports the notion that tallies are used by complex peoples, and to record time in a complex fashion (Marshack 1985). The calendar stick is said to be the most sophisticated problem solving artefact known in North American ethnology, and acts as an astronomical calendar (Marshack 1985: 30). The calendar stick records twelve months per year, with an additional month every three years to bring the calendar into phase with the solar tropical year; thus it documents a precise observational lunar year (Marshack 1985: 27).

The finds above show that although it is generally agreed that most early tallies functioned to record time, they were used in many regions of the world, over a huge time period, by various different communities. They do not necessary die out of use with sedinterisation and farming, and can record far more complex information than mere moon sightings alone. Therefore, the appearance of clay objects c. 8,000 BC as claimed (Schmandt-Besserat 1992, 1996) was not necessary for the supposed need to record more complex information. Tallies would have been capable of aiding the counting and recording of set units of specific commodities in the way that Schmandt-Besserat proposes Neolithic clay objects functioned. The appearance of clay objects in

the Neolithic therefore, cannot be attributed to the supposedly new, and immediate administrative needs of early farmers alone. This view is supported by the continued use of tallies by sedentary communities in Europe, into the medieval period and beyond. This fact, as well as the co-existence of European tallies and written records, demonstrates their ability to carry complex information. It also demonstrates that two divergent administrative recording systems may operate side by side, like clay objects, bullae and incised clay tablets in the proto and early historic Near East. One system did not necessarily have to replace the other.

(iii) Later European Tallies

In literate, Western Europe, wooden tallies formed an integral part of the financial system for centuries. They were public records, in use from the medieval period into the 19th century (c. AD 1100 to AD 1834) (Jenkinson & Ellis 2003: 45-46; Robinson 2007: 54). European tallies of this time period "originally were, and always remained receipts for payments" (Jenkinson & Ellis 2003: 53). Used by the Exchequer and in private transactions within literate society, tallies acted as a reminder to a literate or illiterate person to act or perform a task (Robinson 2007: 54). European tallies of the historic period consisted of a wooden stick, into which notches were cut (Jenkinson & Ellis 2003: 74; Robinson 2007: 54). The notches formed as simple system, with different width and depth notches standing for different but set amounts, easily recognisable to all (Jenkinson & Ellis 2003: 74; Robinson 2007: 54). Explanatory notes were often written on the side of a tally, recording the date and place of transaction. The notes also referred to the notches directly, distinguishing groups of notches by price or commodity. The notches on a tally held purely numerical information, therefore the commodities being referred to could not be identified by the notches alone (Jenkinson & Ellis 2003: 72, 74). Instead of writing notes directly on the side of a tally, labels containing similar information could be attached to the tally itself. In addition, groups of tallies from related transactions were often stored together, in leather bags (Jenkinson & Ellis 2003: 66).

Tallies were extremely popular in many parts of Medieval Europe, with private tallies used universally in the 13th and 14th centuries AD (Jenkinson & Ellis 2003: 68). Their use did begin to decline with the increased use of parchment and paper receipts, yet the two were commonly used in tandem, and large collections of wooden tallies stored in leather bags alongside paper and parchment records are known (figure 2.43) (Jenkinson & Ellis 2003: 68-69). Near identical tallies are reported as being in use in

many world regions in recent times, as far afield as the Torres Strait Islands (just north of Australia's Queensland coast). The islands are home to sedentary agriculturalists, similar in culture to the indigenous peoples of Papua New Guinea (Viteles 1947). When recalling a the 1898 expedition to the islands, Charles Samuel Myers refers to his attempt to gain possession from a local man, of his "tally of love conquests, a bundle of sticks in which each such episode was scored by a notch cut in them" (Viteles 1947: 177). This tally or *kupe* as it was locally known, was created in the same form as contemporary tallies of Europe, yet used to record a very different type of transaction.

The storage of collections of tallies in leather bags parallels the storage of clay objects together in containers, as evidenced at 5th millennium BC Tell Abada and other prehistoric Mesopotamian sites (see above). The dual use of tallies and written receipts bears a striking resemblance to the dual use of clay objects, stored in bullae, and the markings (clay object impressions, seal impressions and/or writing) on the outer surface of the bullae. Above all, the example of Medieval European tallies can be used to argue that in the Near East, the advent of writing did not necessarily make clay objects redundant. Depending on their exact function, clay objects, in opposition to Schmandt-Besserat's claims, could have remained valued tools, used alongside written records, in a complex administration of the early historic period. Indeed their continued presence at sites in the Near East, alongside written documents, and many thousands of years after the widespread adoption of writing supports this. The simple, immediately recognisable numerical recording system of tallies, ensured their continued value and use, alongside and often above writing. Indeed, even in 1925, whilst preparing his publication on the archive of medieval tallies held in the Public Record Office and the Birmingham Free Library, UK, Sir Hilary Jenkinson states in reference to the use of tallies "we know that it has not entirely disappeared even in our own time" (Jenkinson & Ellis 2003: 68). Perhaps the clay objects of the Near East were similarly valued.

KHIPU

Schmandt-Besserat's hypothesis relies on the assumption that tallies, and likewise "simple tokens" of the prehistoric Near East cannot transmit complex information. She interprets "tokens" as more sophisticated than tallies, being able to symbolise specific quantities and perhaps even commodities, but their information storage potential is viewed as limited. Evidence in the form of knot and string records or *Khipu* (or *Khupu*) however, disputes this claim. Although, in form, Khipu is dissimilar to the Neolithic Near Eastern clay objects, its mere existence and use makes us aware that a perceived

simple system can be capable of recording, storing and transmitting highly complex information. Clay objects therefore, if they did act as administration aids, need not have necessary only recorded simple numerical information in the Neolithic period.

Translated literally as "knot" or "knot record", *Khipu* were widely used by the Andean, pre-Columbian (pre 16th century AD) civilisations native to the area of South America now known as Peru (Quilter & Urton 2002: 3). *Khipu* were groups of knotted strings, often dyed in a variety of colours, and were used by the Inca Empire for recording information (Quilter & Urton 2002: 3). Whether or not Khipu acted as a writing system, able to store any manner of information as may be expressed in speech is debated. Yet many scholars do argue that Khipu had no restrictions. It could be "read" like a text, able to record and transmit all varieties of information including histories, poems and narratives alongside economic accounts (Quilter & Urton 2002: xvi, 3).

There are no direct translations of Khipu documents, or explanations of how they worked. Indeed all of our information relating to the use of Khipu comes from the Spanish Conquistadors. As such, Khipu are still not fully understood. A small number of documents written by Spanish chroniclers contain transcriptions of a Khipu's content as recounted by a native. However the accompanying Khipu is never evidenced for comparison. Importantly no Khipu narratives by a native of his own Khipu account exist, and as the Spanish conquerors often refused to accept such a system could be capable of recording any information at all, all accounts must be treated with caution (Quilter & Urton 2002: 3). The AD 1602 account of Diego Avalos y Figuerua records an encounter he had with a native carrying a bundle of Khipu. On interrogation, the native proclaimed that his Khipu contained information listing all Spaniards that had travelled on that particular royal trade route, including what each man had wanted, bought and done (Quilter & Urton 2002: 10). Though not fully understood, the example of Khipu proves the potential of a seemingly simple item, a knotted string, to record, perhaps unlimited information.

2.5-PART THREE:
SCENARIO PLAUSIBILITY & SUMMARY

It is clear from the discussion above, there are a variety of ways in which small clay objects could have been utilised in the Neolithic villages of the Near East. Even when a singular functional role is decided upon (for instance counting), there remain a

multitude of ways in which this task could have been carried out using small clay objects. Below is a summary of the main functional interpretations, and a discussion of their plausibility in the setting of the Neolithic Near East.

2.5(a)-SCENARIO A: ACCOUNTING TOOLS

(i) Counting Aids

There are many different methods in which small objects may have been used in the past to aid counting, and many possibilities in terms of what was counted, why, by whom, where and how frequently. Certainly the sudden and soon widespread appearance of clay objects in the Near East-coinciding with the emergence of fully sedentary agricultural villages is no coincidence. Yet this does not automatically signify that the objects were used to count agricultural goods. Direct evidence for this role in the Neolithic is absent from Schmandt-Besserat's work, yet their utilisation in this activity in literate periods, in conjunction with written records and bullae is automatically assumed to be a mirror of their use in earlier times. Small objects could have been used to count and record all manner of things, and in a complex way, before the advent of writing, and without the objects acting as symbols of set ideas or items. This is supported by the case of the Kingdom of Dahomey census records, the use of tallies in the Palaeolithic, Medieval and early modern European tallies and Andean Khipu. In addition, there is no reason to imagine that even if clay objects were used in accounting at all Neolithic Near Eastern sites, that they were utilised in a uniform way, or to count, record and administer identical or analogous entities.

Sites of the Neolithic of course have many shared features and characteristics (see Chapter 3), yet they also differ in many ways (such a size, layout, the presence of non-domestic buildings, domestic architecture-shape, size and internal use of space and subsistence activities). It therefore follows that what might need to be accounted for at one site, in a particular fashion, may not need to be administered at another. This is further supported by the multitude of numerical notation system in use in the proto and early historic period in South Mesopotamia. This period saw the region covered in a network of huge, urban city-states, united by both a common culture and language; yet even at this time, the notation of numerals was complex and had many forms depending on what was being counted or recorded (figure 2.5) (Nissen *et al.* 1993: fig. 28 pp. 28-29; Woods 2010: 33-34, 40-41). Over the course of the end of the 4th and the 3rd millennium BC, the recording of numerals underwent significant in an attempt to improve arithmetic notation (Nissen *et al.* 1993: 134-38). Yet before this, a single

numerical symbol could take on a different value depending on what was being counted.

(ii) Information Storage and/or Mnemonic Aids

No convincing evidence has so far been published to prove clay objects formed part of a widespread and consistent symbolic system-with each shape representing a specific number, or a set unit of a specific product. Evidence from 4th millennium BC Uruk and Susa, the two centres from which the earliest writing emerged, does not support Schmandt-Besserat's argument that the earliest written symbols, incised into wet clay tablets, replicated the impressions of clay objects, and maintained the standardized, and widespread symbolic meaning of their three dimensional counterparts. There is no evidence that at this time, or earlier, geometric clay objects of different shapes stood for specific commodities, in a system recognised by all, across the entire region. The written evidence does not support this claim, nor does any of the archaeological evidence Schmandt-Besserat presents (1992b). Clay objects representing the most common commodities of the 4th millennium, sheep and barley for example would be expected to be found at each and every sites studied, and dominate the assemblages of clay objects at all sites. This is simply not the case. Within the textual evidence, there is a lack of correlation between the shape of specific clay objects, the design left by their impression onto wet clay, and the shape and meaning of the apparent matching early cuneiform sign. Additionally, as explained above, there was no set, abstract numerical system within cuneiform script of the 4th and 3rd millennium BC. thus clay objects, even if each shape did represent a set numerical value, could not have evolved directly into a set repertoire of abstract number signs.

Despite this, clay objects may still have held a great deal of information, transmitted via differences within shape, size, clay colour, finish and other variables. The example of Khipu, where bunches of knotted strings recorded information in a variety of genres is just one example that this is possible. The Near Eastern clay object system may have been simpler, indeed the combination of clay "tokens" stored inside and used along with hollow clay envelopes – impressed and incised on their outer surface with writing and other symbols is reminiscent of European Medieval tallies, where the shape and depth of notches on a piece of wood symbolised a set amount of currency, yet the information held within the tallies was often supplemented by writing in ink on the surface of the tally, as well as attached labels of parchment containing additional written information.

2.5(b) - SCENARIO B: GAMING PIECES

Gaming pieces is a very plausible alternative to options (i) and (ii) above, yet is difficult to directly prove or disprove. In the context of gaming, clay objects could have functioned in a variety of ways both-within a single gaming system, and across different games. The identification of gaming pieces is often carried out by the analysis of the different shapes and sizes of gaming pieces, along with an identification of object sets based on their stylistic differences and differing quantities of these. Yet this technique is based on our modern idea of gaming pieces, as being collections of sets of identical objects, with different shapes, sizes and colours performing differing functions on a gaming board. This modern view of gaming cannot serve to either verify or discredit the gaming piece interpretation of prehistoric clay objects.

Clay objects may have been used in a variety of different games, and need not necessarily need to fit our idea of board games with uniform shaped and sized pieces fitting onto an accompanying board. People may have utilised whatever objects were at hand to act as gaming pieces, with some choosing to invest more time and energy in creating aesthetically pleasing gaming pieces than others. Impromptu gaming carried out using organic and waste material such as seeds, shells, bones or whatever else was found discarded on a site is also likely, and thus the absence of large assemblages of clay objects at some sites, of from some areas within them, may not necessarily signal an absence of gaming in those areas. Indeed, the presence of gaming boards is often viewed as definitive proof of the existence of gaming, therefore where gaming boards are absent; the interpretation of clay objects as gaming pieces is rarely taken seriously.

There are today, plenty of games that do not utilise boards-a very likely feature of Neolithic gaming also. If board games were popular, like gaming pieces, boards need not have been permanent items-made to last. They could have been made from a variety of materials that may not survive archaeologically, and quite likely in some circumstances at least, were temporary features, made for example by marking a board into the ground, or creating a board on the floor or another surface using twigs or other such materials –thus invisible archaeologically. Furthermore, a variety of games were likely played in the Neolithic Near East, as they are today. When games are discussed, we are not necessarily suggesting one common game. As such, the differing appearance and proportions of clay objects across Neolithic Near Eastern sites can be explained by

the existence of site specific games, as well as different choices in game playing within and across sites.

Definitive proof of the use of clay objects as gaming pieces, and the type of games they might have been used in is not available for the Neolithic period. When gaming is discussed archaeologically, the well preserved, often highly crafted examples of board games known from Ancient Egypt and 3rd millennium BC south Mesopotamia are used as prime examples. Historical and ethnographic gaming evidence, as well as archaeological data from the Near East and Egypt from the 3rd millennium BC onwards, clearly highlight the rich record of gaming in the present and past, using different combinations of pieces, boards, both or neither. Comparisons are useful in highlighting different ways in which clay objects may have been used in gaming in the Neolithic.

Evidence of gaming in the Near East of the 3rd millennium BC onwards is indisputable. Though indirect, the probable Neolithic gaming boards along with the many geometric clay objects found, combined with the later evidence adds weight to the idea of Neolithic gaming. Though coarse in appearance, we must remember that the known examples of 3rd millennium Mesopotamia gaming are the most lavish examples, from elite and royal contexts. More humble gaming pursuits were likely carried out using more simple equipment. This kind of conclusive gaming evidence is not available from Neolithic sties, and though alternative, non-gaming explanations Neolithic clay objects cannot be ruled out, the gaming piece interpretation remains a strong option. Of course, Neolithic clay the objects may have acted as gaming pieces at some sites and time periods, as administrative items at others, or had an interchangeable function.

2.5(c) - SCENARIO C: DIVINATION, SORTATION & RITUAL

Related to gaming is the use of geometric clay objects in decision making and to foretell future events. Though there is no direct evidence of this practice (indeed it would be near impossible to prove in Neolithic archaeology), utilisation of objects in the casting and drawing of lots, is seen commonly throughout history and ethnography. Lots can be a method of selecting people to fulfil a particular task (e.g. to fight or to go hunting), or to make other important decisions. Numerous examples of use can be found from all regions and time periods (for use in 19th century English in the division of land see Johnson 2011: 141, for the division of archaeological finds see Murray 2007: 254, in ethnography see Latham 1859, and Vinding 1998). The number, size and variety of appearance of the many collections of clay objects from Neolithic Near Eastern sites

(Chapters 6 to 9 and Appendices A and J) certainly suggest the possibility of the use of the objects as lots. Many are small enough for a few to be placed into a container or cupped in the hand-ready to be tossed or selected by an agent.

The newly emerged agricultural communities of the Neolithic Near East would certainly be in need of decision making tools, and lots may have been useful in making fair, undisputable and unbiased decisions. Many decisions would need to be made related to hunting and animal herding, plant animal cultivation, the distribution of resources (including meat, cereals, land, and animals) and the distribution of labour roles. Lots could have been a way to make difficult decisions and to ease tension and competition, and avoid confrontation between individuals and families within the growing village settlements of the Neolithic. Gaming may have served a similar function, with the winner(s) of a game seen as being chosen by the gods (as in divination) or purely by his skill in gaming, awarding him something advantageous. This may have been a particular social role or position, sole access to a specific resource, the best share of a piece of land or portion of meat for example, or the authority (divine or otherwise) to make decisions with regards to resource distribution, animal or plant management within the community (see Roeber 2008: 134, and also Schlegel 1899).

Similarly divination is a possible role for small geometric clay objects as part of ritual practice. The Neolithic period in West Asia evidences a surge in ritual activities (see Chapter 3), and therefore the use of clay objects as a part of normal magic and ritual activity is not unrealistic. There are multiple methods of divination, but it can be imagined that like lots, clay objects (individually or as a group), were cast or drawn, with the selection of an object or group of objects with a particular quality (shape, colour, or displaying a particular marking or fold in the clay), or the resultant distribution of the objects interpreted as portraying a message from higher beings or signalling the outcome of a decision. One of the oldest recorded examples of divination comes from Shang Dynasty China, where bones were heated and the subsequent cracks studied. Tortoise shells were used in the same way with the cracks in the shell studied (see Flad 2008, similar examples can be seen using shells and bones in Han Period China: Loewe 1988, and from Tibet: Laufer 1914: 191). Like lots, there is no direct evidence for divination, yet as will be seen, the characteristics of the objects present at some Neolithic Near Eastern sites are consistent with those required in such activity,

and the agricultural communities of the Neolithic certainly would have had the need to make decisions and distribute resources.

2.6-SUMMARY

To date, interpretations of the earliest, Neolithic clay objects have centred on their use in counting, accounting and administration. This role of clay objects has been advocated purely by reference to evidence of the use of similar objects at a small number of sites located in southern Mesopotamia and Elam, four to six millennia after they first appear in the archaeological record. To date, Schmandt-Besserat has been the only scholar to study assemblages of clay objects from a large number of sites. The interpretation she advances is largely unsubstantiated for the Neolithic period, and many details of her argument, in relation to the early historic period have been convincingly disputed. Very little direct evidence for the functioning of clay objects as counting aids, used to account agricultural produce in the Neolithic has been published. Likewise, Schmandt-Besserat (1992a, 1992b, 1996) presents no convincing evidence to support her interpretation of clay objects being used as mnemonic aids from the 4th millennium BC, operating within a set, regional symbolic system and in addition, evolving directly into the earliest written symbols. Despite this, Schmandt-Besserat's theory dominates current thinking regarding the use of clay objects in all periods in the Near East. Debate is not centred on the theory in itself, but on the detail within it. The dominance of Schmandt-Besserat's ideas in the field of Near Eastern archaeology appears to be due to the lack of a convincing alternative idea, and the corresponding lack of quantitative research into the topic of clay objects.

Currently, the use of geometric clay objects as accounting aids or within the sphere of gaming are the most likely contenders for the function of the Neolithic objects. However, exactly how they might have been used within these two realms is still unclear. Hopefully data collected from more recently excavated sites, with reference to the form of the object, and also their find context within sites and the presence or not of associated objects, alongside information related to the type of sites clay objects are and are not found at, may better aid scholars in understanding exactly how clay objects were used by people in the Neolithic Near East. My data collection will therefore focus on aspects of the archaeology which might be related to administration and gaming, as will the following chapter, a review of the Neolithic of the Near East. However, my research will still be carried out with an open mind, considering all of the other functional possibilities as outlined in this chapter.

ILLUSTRATIONS

FIGURES:

Figure 2.1: (Top) Example of a clay "bulla" (or envelope), impressed with two different cylinder seals. From Hacinebi, southeast Anatolia/upper Mesopotamia. Surface find from operation 6. Late 4th millennium BC (Late Uruk period) c. Susa levels 17b-18 (based on stylistic comparison of the cylinder seal impressions from Susa and on the bulla). Bulla measures 7.8cm diameter. Recovered broken, yet securely contained inside were 12 "tokens" of four different forms: 6 small spheres, 4 large spheres, 1"disc" and 1 "lentoid". The disc displays a single linear incision across one surface. All "tokens" measured 1.0-2.5 cm. (Pitman 1996: fig 18a p. 231). **(Bottom)** two opened bullae displaying the spherical (left) and disc-shaped (right) geometric clay objects sealed inside them *in situ*. Both from the late-4th millennium cal. BC (Late Uruk Period, c. 3'350-3'100 cal. BC), Choga Mish, Iran. (Adapted from Woods 2010: no.32 & 33 p. 66).

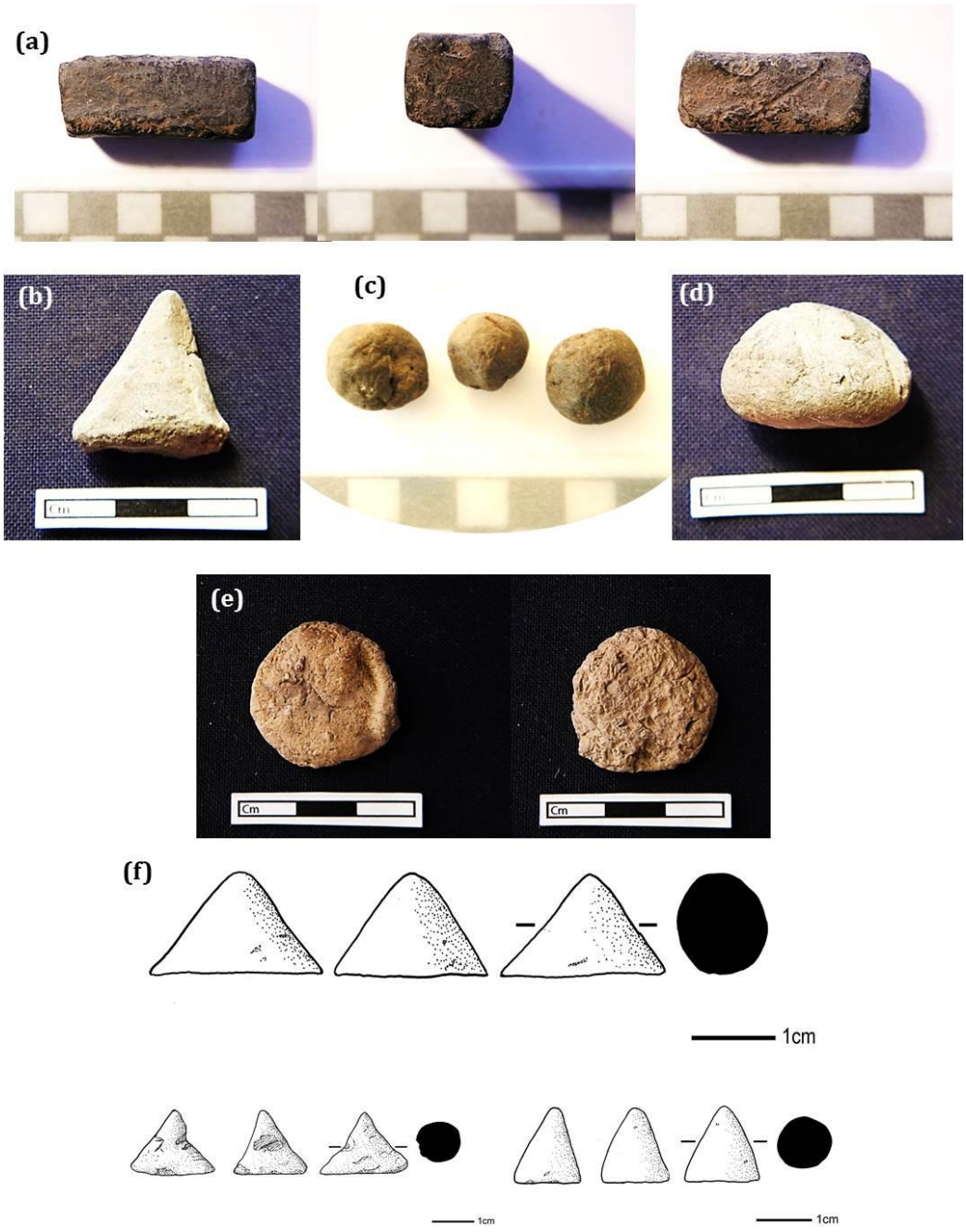


Figure 2.2: Illustrative examples of the range and shape of small geometric clay objects which appeared at sites across the Near East from the start of the Neolithic period c. 10th millennium cal. BC. All shown here fall into Schmandt-Besserat's "plain token" category. **(a)** Cuboid-shaped clay geometric from 8th–7th millennium cal. BC Çatalhöyük, Central Anatolia. Clay Object Number 1283. **(b)** Triangular-shaped clay geometric from 9th-8th millennium cal. BC Boncuklu Höyük, Central Anatolia. Clay Object number 1483. **(c)** Selection of small clay spheres from Çatalhöyük; Clay Object Numbers 344, 345 & 346. **(d)** Semi-sphere. Boncuklu Höyük; Clay Object number 1515. **(e)** Front and reverse of disc shaped geometric from Boncuklu Höyük. Clay Object number 1440. **(f)** Range of cones from Çatalhöyük. CO#s 1080, 1120 and 1151. (Photographs: author's own. Drawings: Mesa Schumacher, courtesy of the Çatalhöyük Project).

Figure 2.3: Example of what Schmandt-Besserat terms "complex tokens". Late 4th millennium cal. BC (Late Uruk Period, c. 3'350-3'100 cal. BC), Choga Mish, Iran. (Adapted from Woods 2010: no. 23-26 p. 62 and no. 27 p. 63).

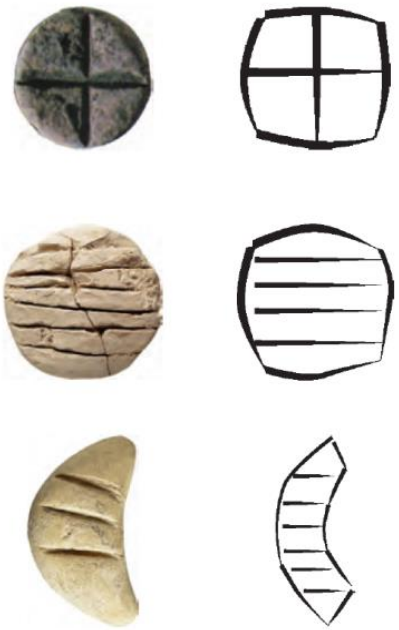
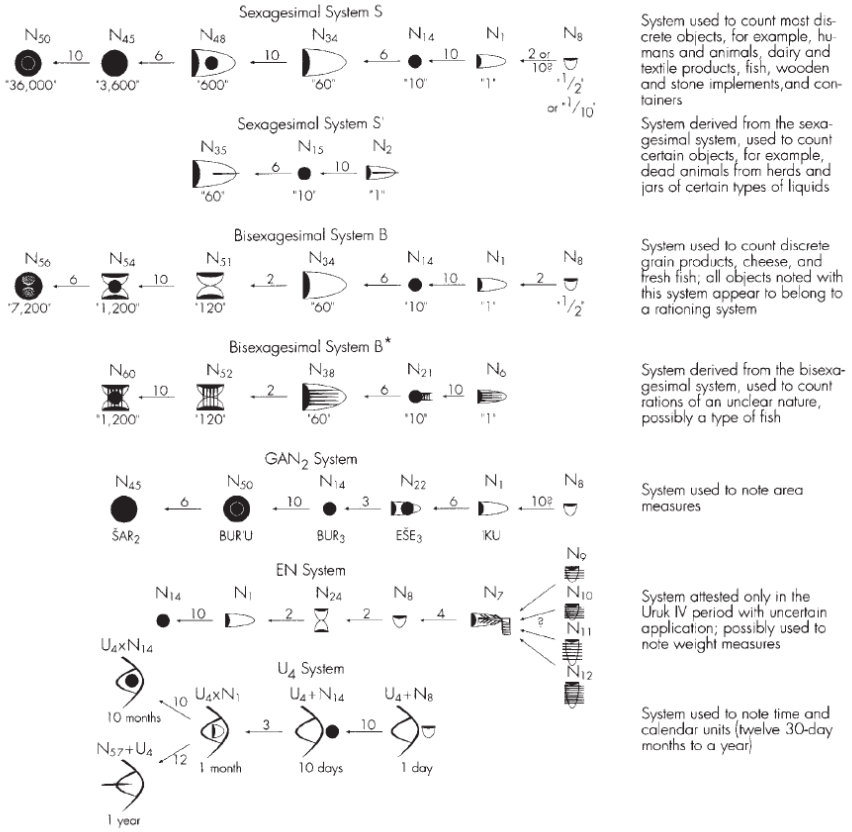


Figure 2.4: Comparative examples of "complex [marked or incised] tokens", and corresponding proto-cuneiform (mid-late 4th millennium BC) symbols. The symbols represent (top to bottom): sheep and goats, wool and silver. (Adapted from Woods 2010: fig. 2.15 p. 48).



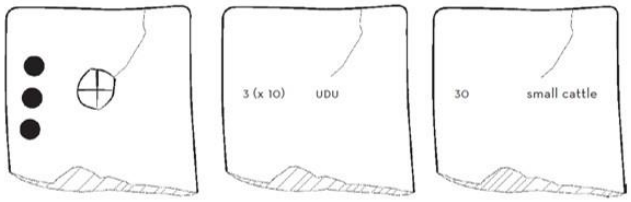


Figure 2.5: (Top) diagram showing the complexity of counting recording systems in early literate Mesopotamia. Many different systems of symbols were in contemporary use, each used to count and record counts of different types of items and commodities in proto-cuneiform (mid to late 4th millennium cal. BC) (Adapted from Woods 2010: fig. 2.9 p. 41). **(Bottom)** reverse side of an archaic clay tablet from the late 4th millennium (c. 3,100 cal. BC). Records "three small cattle": represented by the three small circular holes (each representing one unit), and the round symbol with a cross-the sign for "cattle" (unknown province). (Adapted from Woods 2010: no. 55 p. 81).

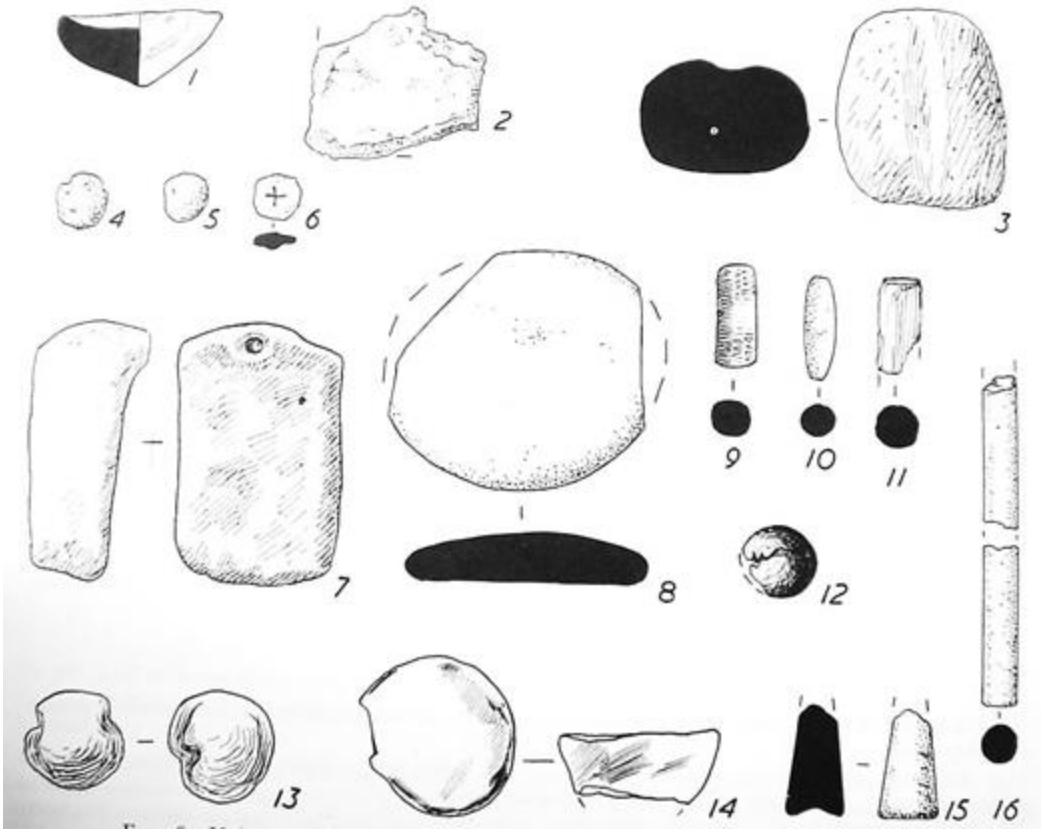


Figure 2.6: Illustration of "Miscellaneous Small Finds" of unfired clay from Neolithic Jericho. Item "6" (registration no. 2886, PPNA) is published as a "gaming piece", whilst numbers "4" (registration no. 2764, PPNA) and "5" (registration no. 2875, PPNA) are not, despite the obvious similarity in form. (Kenyon & Holland 1983: fig. 367-p. 816).

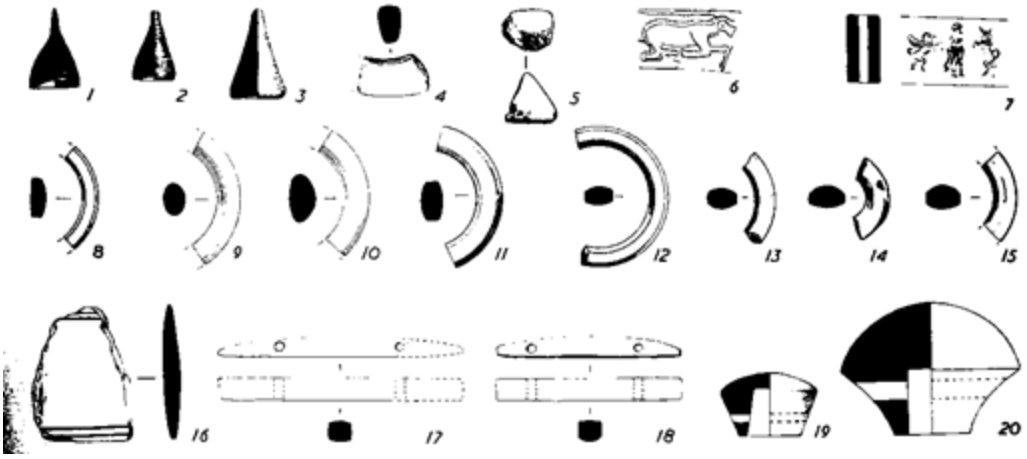


Figure 2.7: Selection of "Miscellaneous Objects" from Pottery Neolithic A Jericho. Items 1 to 5 are published as "gaming pieces" (Kenyon & Holland 1982: fig. 266-p. 557).

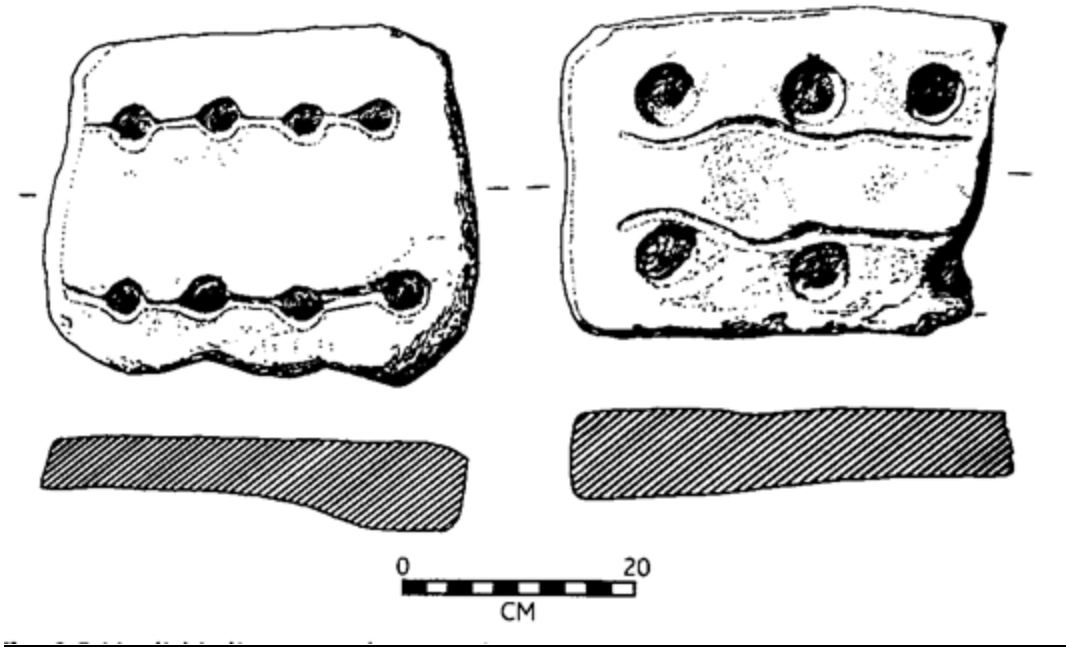


Figure 2.8: Neolithic "gaming boards" of limestone. PPNB Beidha, Jordan. Both from level II. (Simpson 2007: 6).

Figure 2.9: Neolithic limestone game board from PPNC 'Ain Ghazal, Jordan. From the floor of a disused house, square 4453, South Field excavation area. (Simpson 2007: 7).

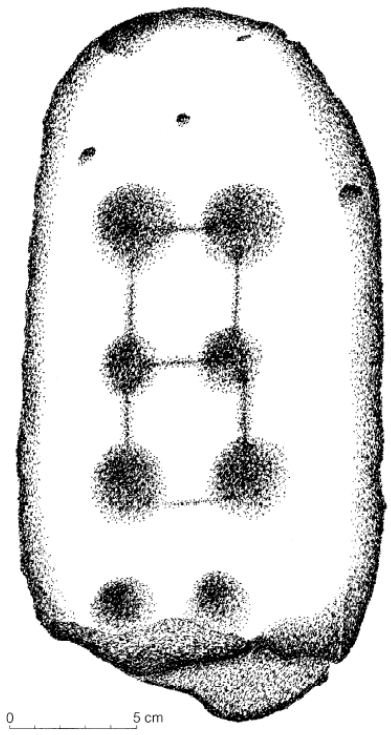


Figure 2.10: Possible gaming board from 7th millennium, Ghwair, located at the meeting point of the Wadi Faynan and Wadi Ghwair in the Southern Levant. (Simmons & Najjar 2006: fig 7 p. 88).

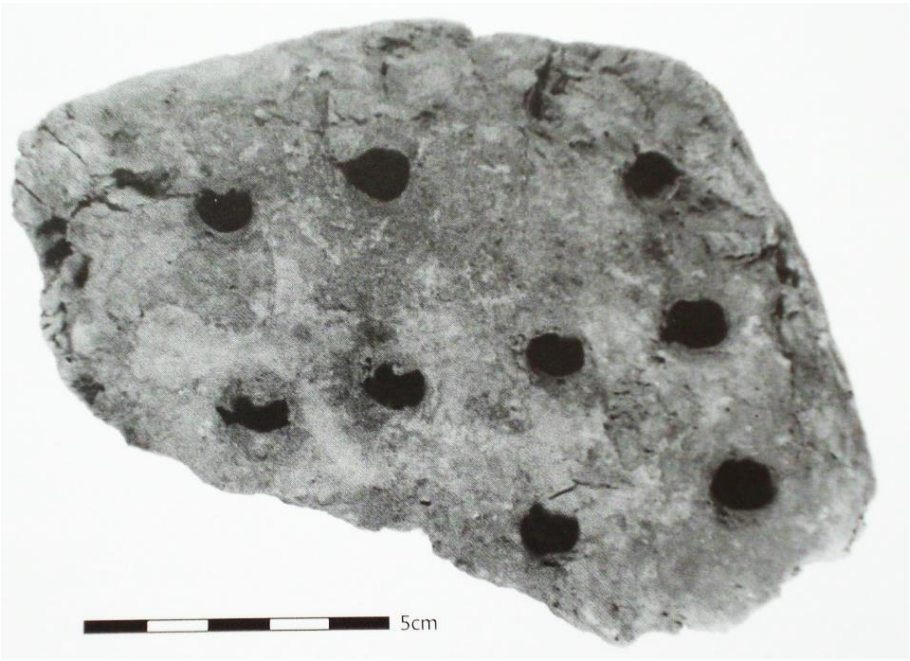


Figure 2.11: Gaming board from Neolithic (6th millennium BC) Chagha Sefid, the only example of gypsum. (Simpson 2007: 7).

Figure 2.12: One of two limestone "gaming boards" from Shir, west Syria. (Bartl, Ramadan & Al-Hafian 2011: fig. 28 p. 72).

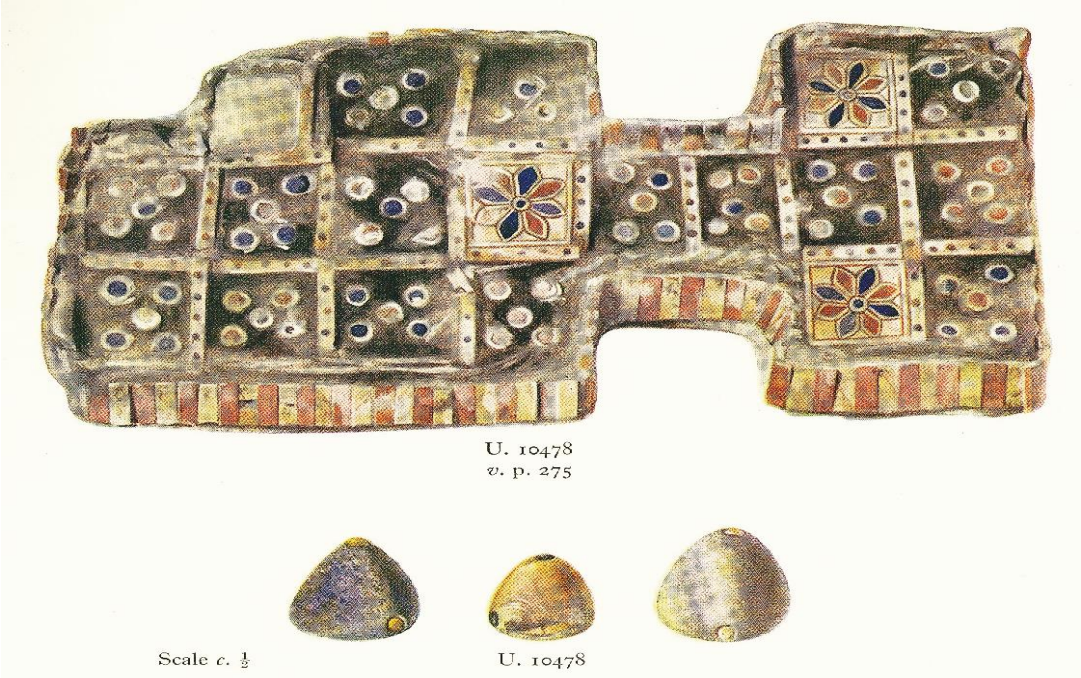


Figure 2.13: Near complete inlaid gaming board and "dice" from the Royal Cemetery at Ur (mid-3rd millennium BC). Wooden board with shell, ivory, limestone, lapis lazuli and gold inlay. Dice are of shell, lapis lazuli and gold. (Becker 2007: pl. 95).

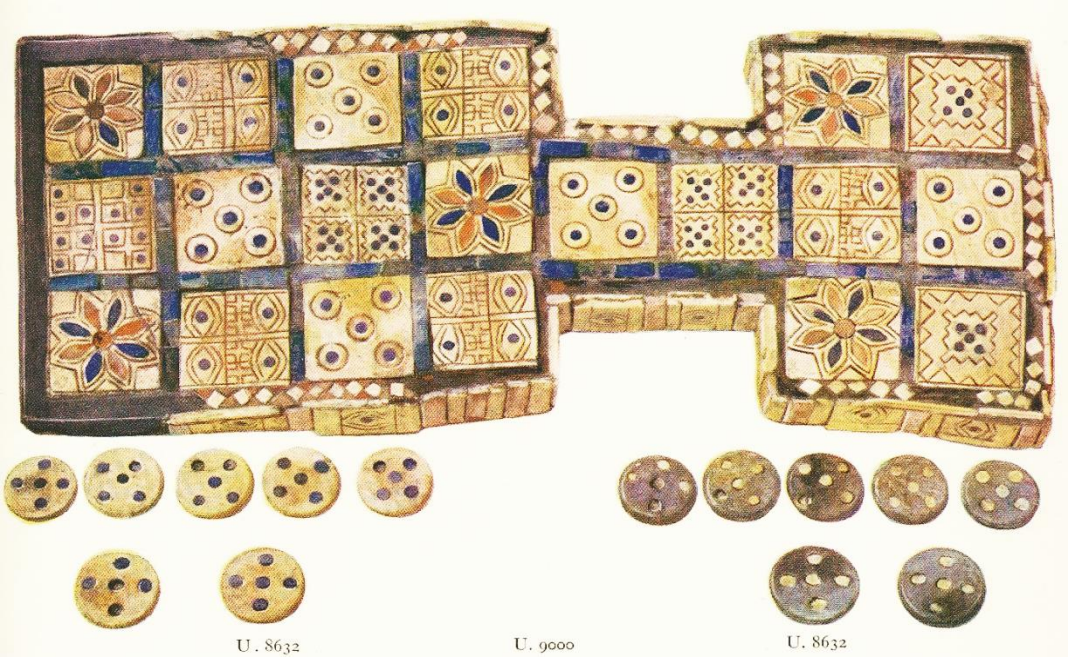


Figure 2.14: Gaming board and round playing pieces of black shale and shell. From the Royal Cemetery at Ur, mid-3rd millennium BC. (Becker 2007: pl. 95).

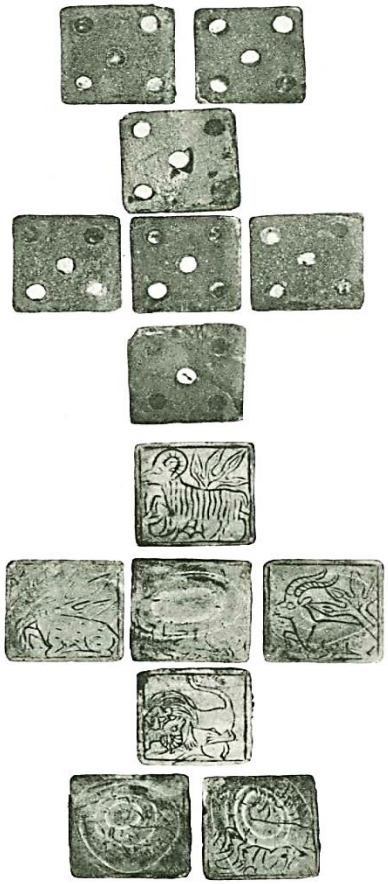
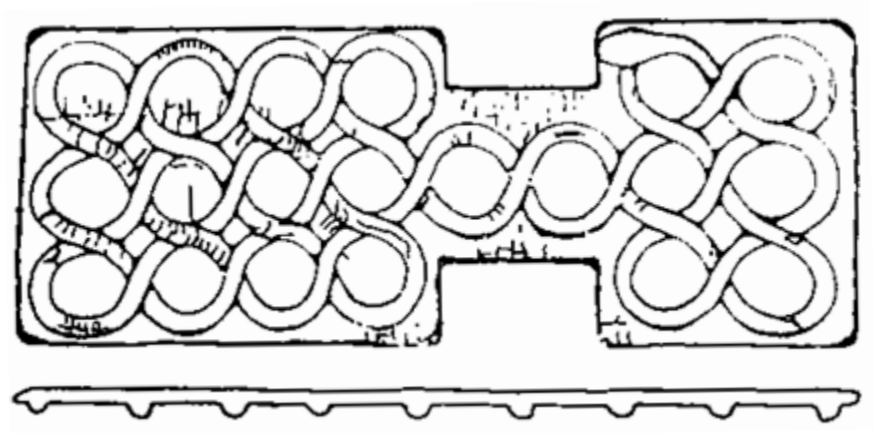


Figure 2.15: Gaming board with shell plaques depicting animal scenes. Set in silver with lapis lazuli boarders. From the Royal Cemetery at Ur, number U. 10557. (Becker 2007: pl. 95).

F**igure 2.16:** Gaming pieces of shale and engraved shell. Complete set found inside gaming board U. 10557 (figure 2.15). (Becker 2007: pl. 95).

Figure 2.17: "Dice" of shell, lapis lazuli and gold from the grave of Queen Shub-Ad's. Registration U. 10478. From the Royal Cemetery at Ur. (Becker 2007: pl. 158).



(a)

(b)

Figure 2.18: (Top) Wooden gaming board, identical to the ornate boards at the Royal Cemetery, Ur. This example is the only contemporary, identical gaming board found outside Ur. From Shahr-i-Sokhta, Iran. (Becker 2007: 11). **(Bottom)** Selection of the 49, small, carved stone objects interpreted as gaming pieces. All were uncovered together in a cluster, from an early 3rd millennium BC burial in the southeast Anatolian site of Başur Höyük. A range of shapes including geometrics (pyramids and lozenges) and animals (such as pigs and dogs) are represented. Different coloured stones were used to create the objects, which were also painted in green, red, blue, black and white. (Lorenzi 2013).

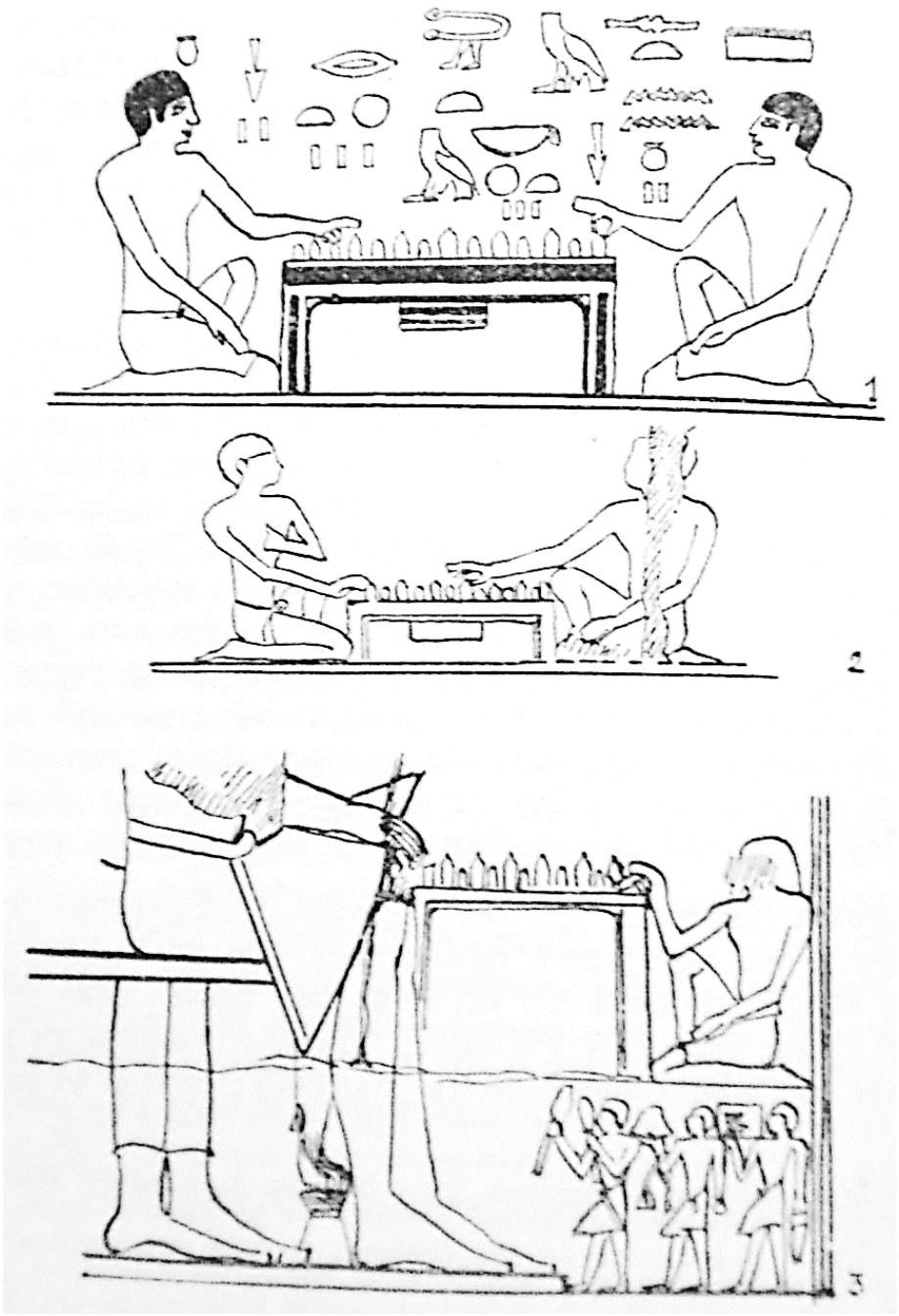


Figure 2.19: Three depictions of "Senet" playing, all from dynastic Egyptian tombs. **(Top)** From the tomb of Herenkaou, **(middle)** & **(bottom)** from the tomb of Mererouka. Note the identical playing pieces depicted in each drawing. (Vandier 1964: 494).

Figure 2.20: Senet board and playing pieces. Faience, from Tanis-19th Dynasty. (Freed 1982: fig. 100-p. 54).

Figure 2.21: Polished stone artefacts from Neolithic Çayönü. One of 22 near identical objects uncovered, each approximately 7-8 cm in height. No interpretation proposed by the excavators. (Çambel & Braidwood 1979: 149).

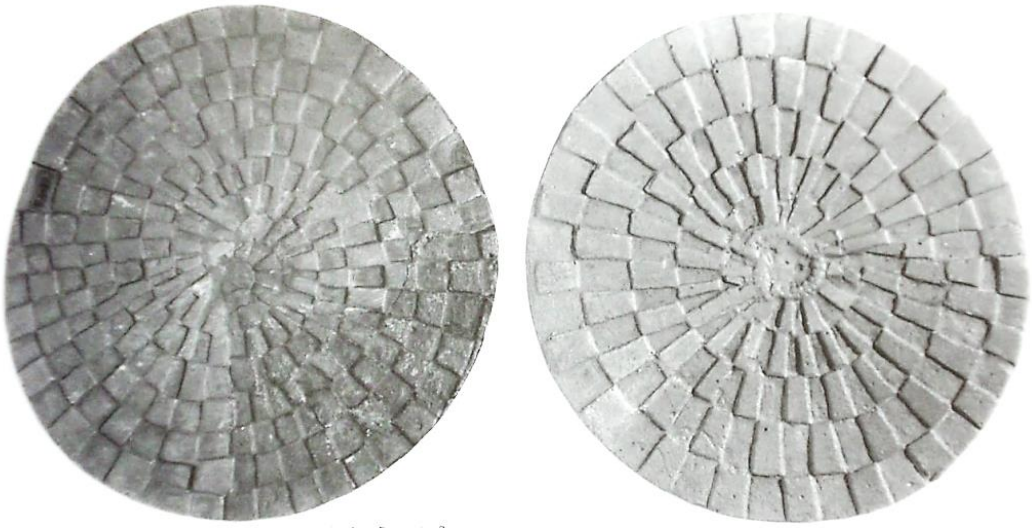


Figure 2.22: Example of "Mehen" boards. Both from the 2nd Dynasty tomb of Peribsen at Abydos. (Kendall 2007: figs. 4.4 & 4.5-p. 35).

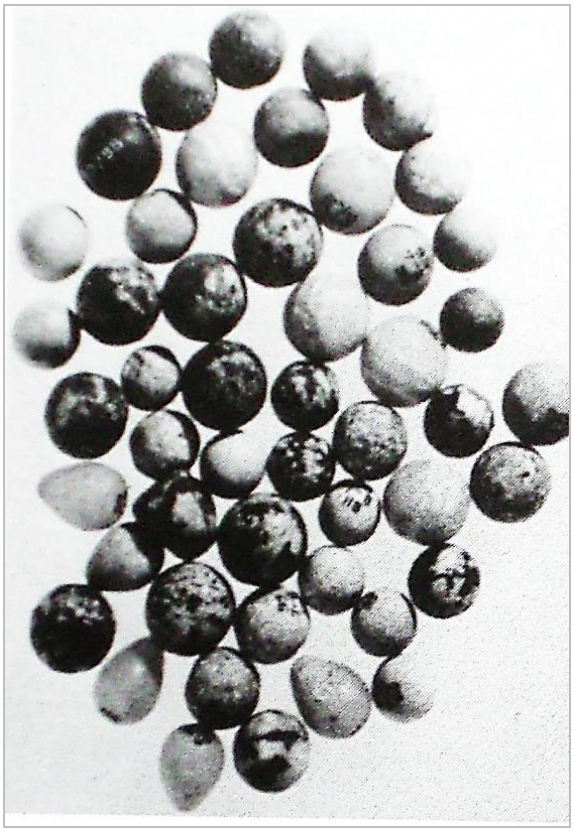


Figure 2.23: Small spherical objects described as "marbles" Used for playing "Mehen". (Kendall 2007: fig. 4.2a-p. 34).

Figure 2.24: Ornately carved ivory lions and lionesses-playing pieces for "Mehen". From tomb M. VIII at Abu Roash, 1st Dynasty c. 3,000-2,830 BC. Early Dynastic Period. Maximum height: 3. 5 cm, length: 6. 5 cm. (Der Manuelian & Jaquet-Gordon 1987: fig. 12-p. 47).

Figure 2.25: Range of ivory zoomorphic figurines for "Mehen" playing. Top: lions and bottom: dog. (Kendall 2007: figs. 4.2a, 4.2b & 4.3-p. 34).

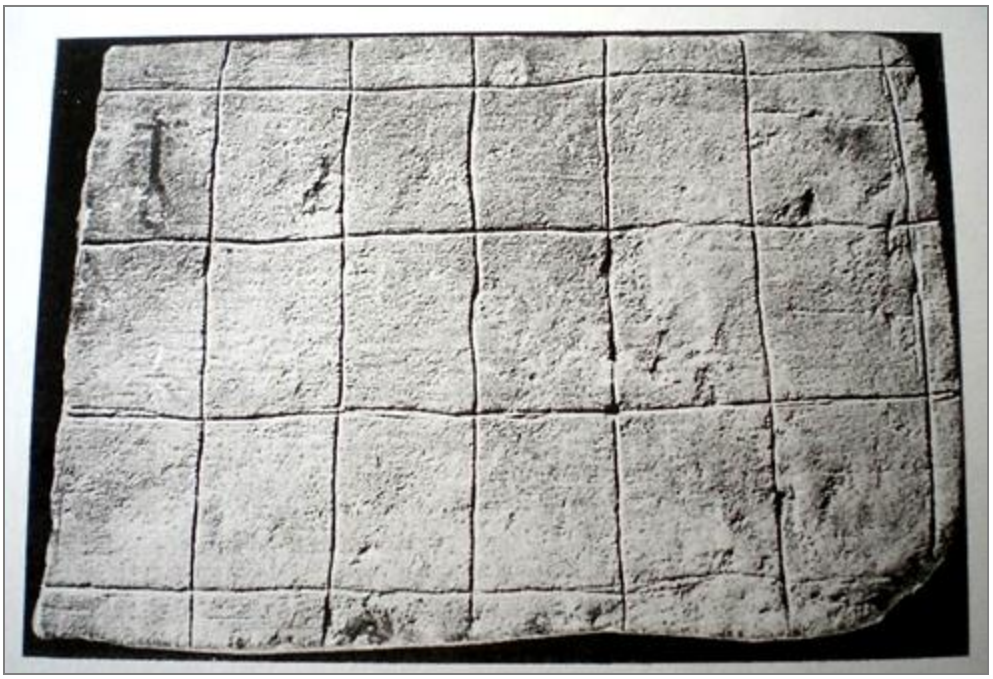


Figure 2.26: A humble gaming board made from a clay slab incised with lines. From Middle Kingdom Kahun, a Lower Egyptian workers village. (David 1979: pl. 6-p. 15).

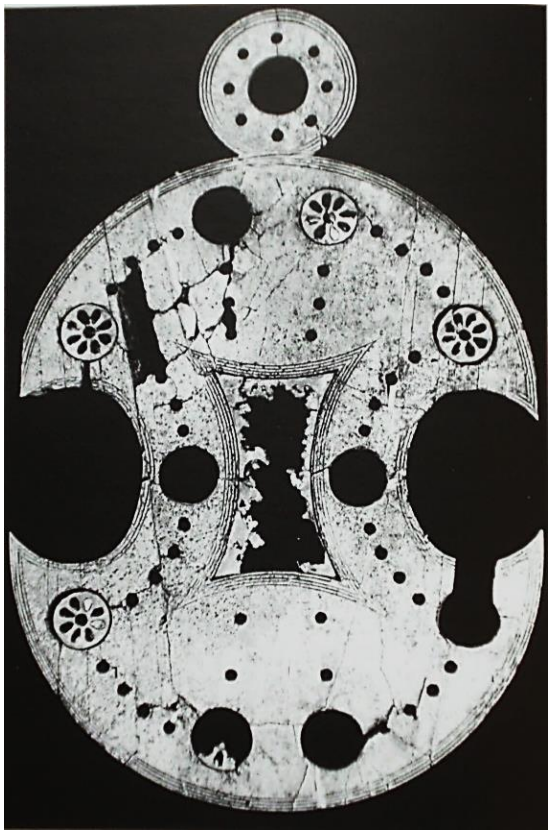


Figure 2.27: A Near Eastern version of the traditional Ancient Egyptian Hounds and Jackals board game played using pins adorned with carved dogs and jackals. (Hoerth 2007: fig. 7.4, p. 66).

Figure 2.28: Selection of clay objects or "tokens" from the Near East (Robinson 2007: 59).

Figure 2.29: Example of a Mancala (or Mankala) board game and playing pieces (small pebbles kept in a bag). This game dates to the 20th century AD; belonging to the Buganda people of modern Uganda. Wood, length: 101. 60 cm. (Walker 2007: fig. 28.8-p. 254).

Figure 2.30: Further examples of wooden Mancala (or Mankala) board games. **(Top)** ornate Mancala board of the Yoruba people-present Nigeria and Republic of Benin. 20th century AD. Length: 63. 5 cm. **(Middle)** two piece foldable Mancala board from 19th century AD Ethiopia. Length: 60. 4 cm. Accompanied by a cloth bag containing pebbles-gaming pieces. **(Bottom)** Swahili board, East Africa. Length: 64 cm. (Walker 2007: fig. 28.1-p. 251).

Figure 2.31: Straw slingshot with spherical clay pellets. From Middle Kingdom Kahun. Egypt (c. 1'900 BC). (David 1979: pl. 4-p. 15).

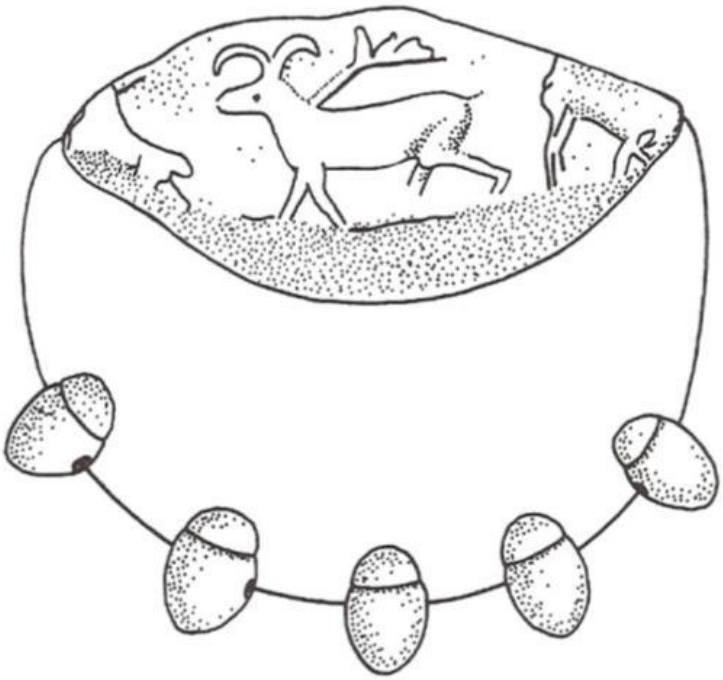


Figure 2.32: Drawing showing Schmandt-Besserat's proposed use of clay objects, along with a large solid ovoid or "bulla"; all held together by a piece of string. (Schmandt-Besserat 1996: fig. 11 p. 41).

Figure 2.33: Drawing illustrating the range of geometric clay objects or "calculi" as they are referred to, from the 5th millennium BC sites of Tell 'Ubaid and Tell Abada (Jasim & Oates 1986: 356).

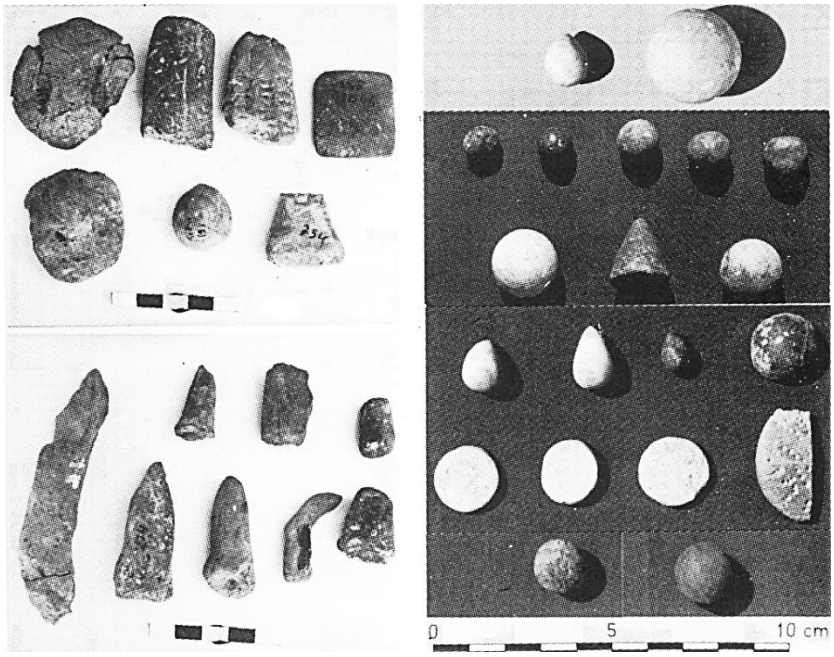


Figure 2.34: Range of geometric clay objects (some incised), published as "calculi". From 5th millennium BC Tell Abada (left) and 4th millennium BC Tell Brak (right). (Jasim & Oates 1986: pl. 1 p. 357).

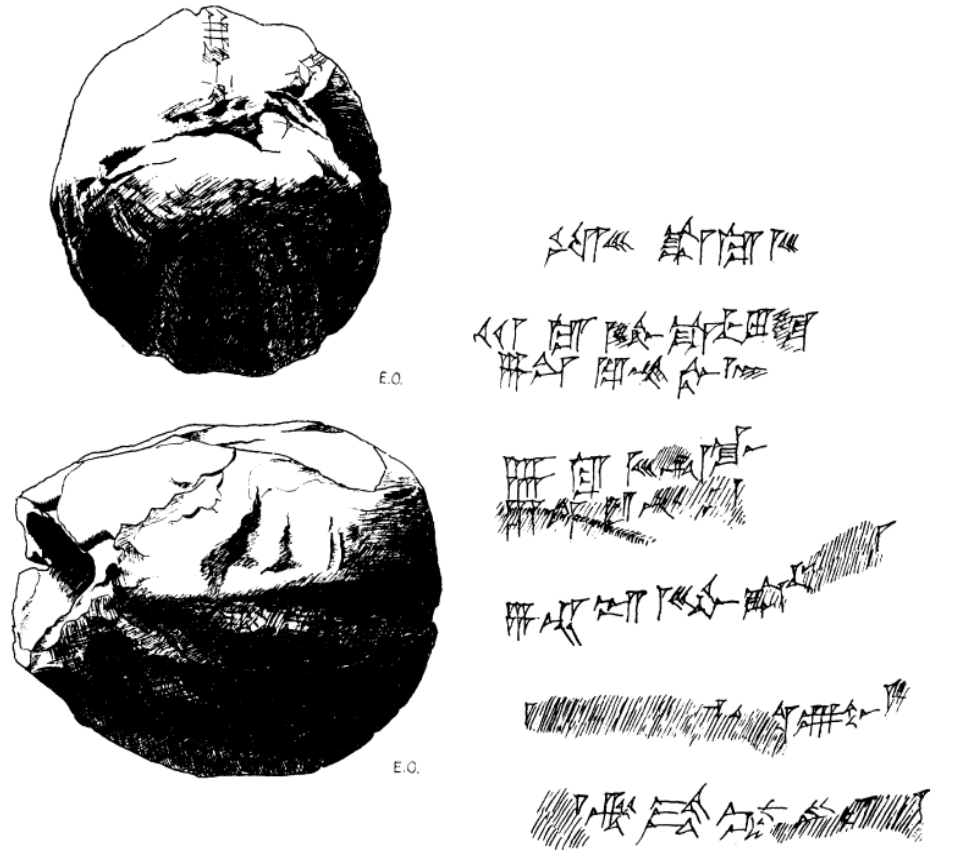


Figure 2.35: (Top) hollow, egg-shaped clay envelope (or bulla) from Nuzi (Adapted from Woods 2010: fig. 2.13 p. 46). **(Bottom)** drawing of a cast of Text 449 and detail of the 8 liens of written text, an administrative cuneiform text from 2nd millennium BC Nuzi, modern Yorghan Tepe. (Leo Oppenheim 1959: fig. 1 & 2 p. 122).

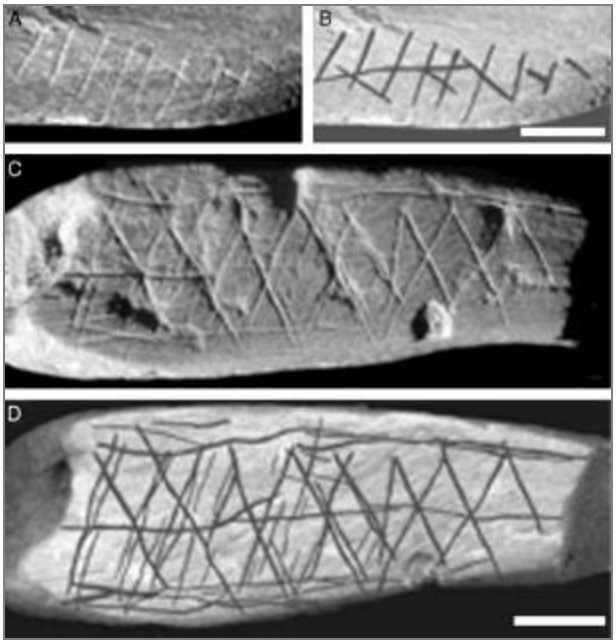


Figure 2.36: The Blombos Ochre – and incised stone dating to c. 75,000 BC. Recovered from Blombos Cave, southern Cape coast, South Africa. The abstract engravings on the pieces of ochre are often claimed to be the oldest know "artwork", and are attributed by some as the earliest evidence of recording as they are often interpreted as lunar notations in the form of a tally. (Sy & Tinker 2006: 110).

Figure 2.37: The Ishango Bone recovered from the small fishing village of Ishango on the Zaire-Uganda border. The bone is engraved with markings, now thought to represent a prehistoric tally. The markings are divided into three rows, and like the Blombos Ochre (see above), are claimed to represent an early system of recording of the lunar phase calendar. (Sy & Tinker 2006: 115).

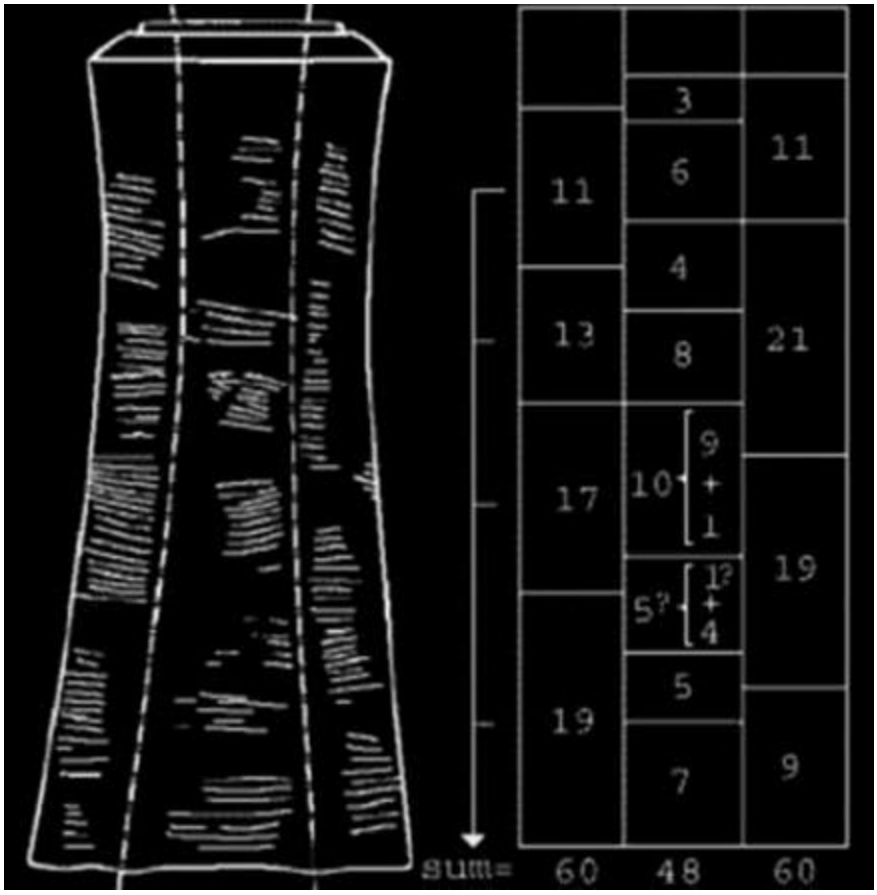


Figure 2.38: Drawing of the Ishango Bone highlighting the detail of its markings which are separated into three sections. According to Sy and Tinker, the outer two rows each have markings totalling 60 (the row on the left containing sets of notches representing only prime numbers between 10 and 20, while the row on the right has sets of marking based on a numeration system based on 10). The central row appears to illustrate duplication (multiplication by two). (Sy & Tinker 2006: 116).

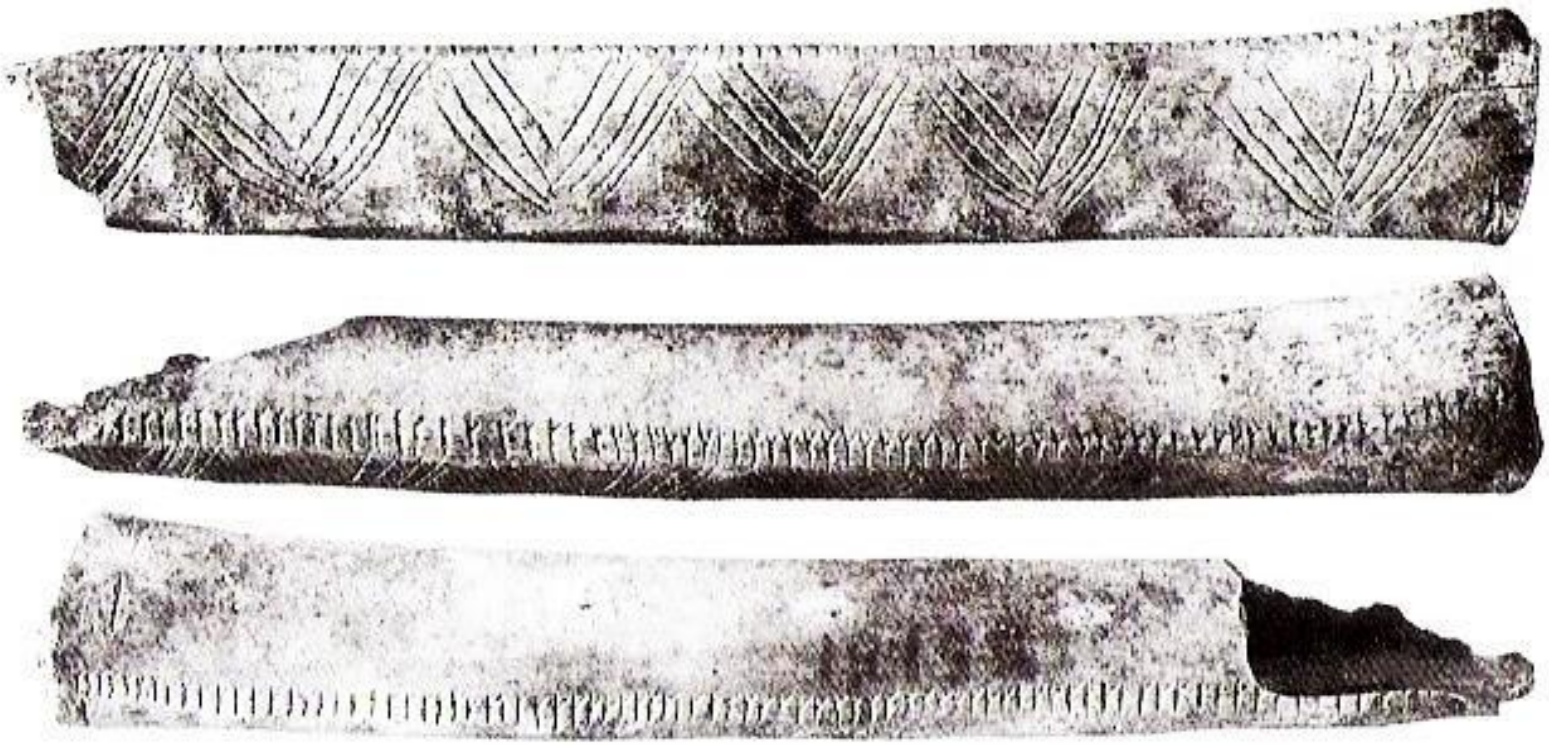


Figure 2.39: Engraved Palaeolithic eagle bones from Le Placard, near Charente, Western France. The bones have been dated to 13'500 BC, and are thought to be an early notation system charting the lunar cycle (Robinson 2007: 54).

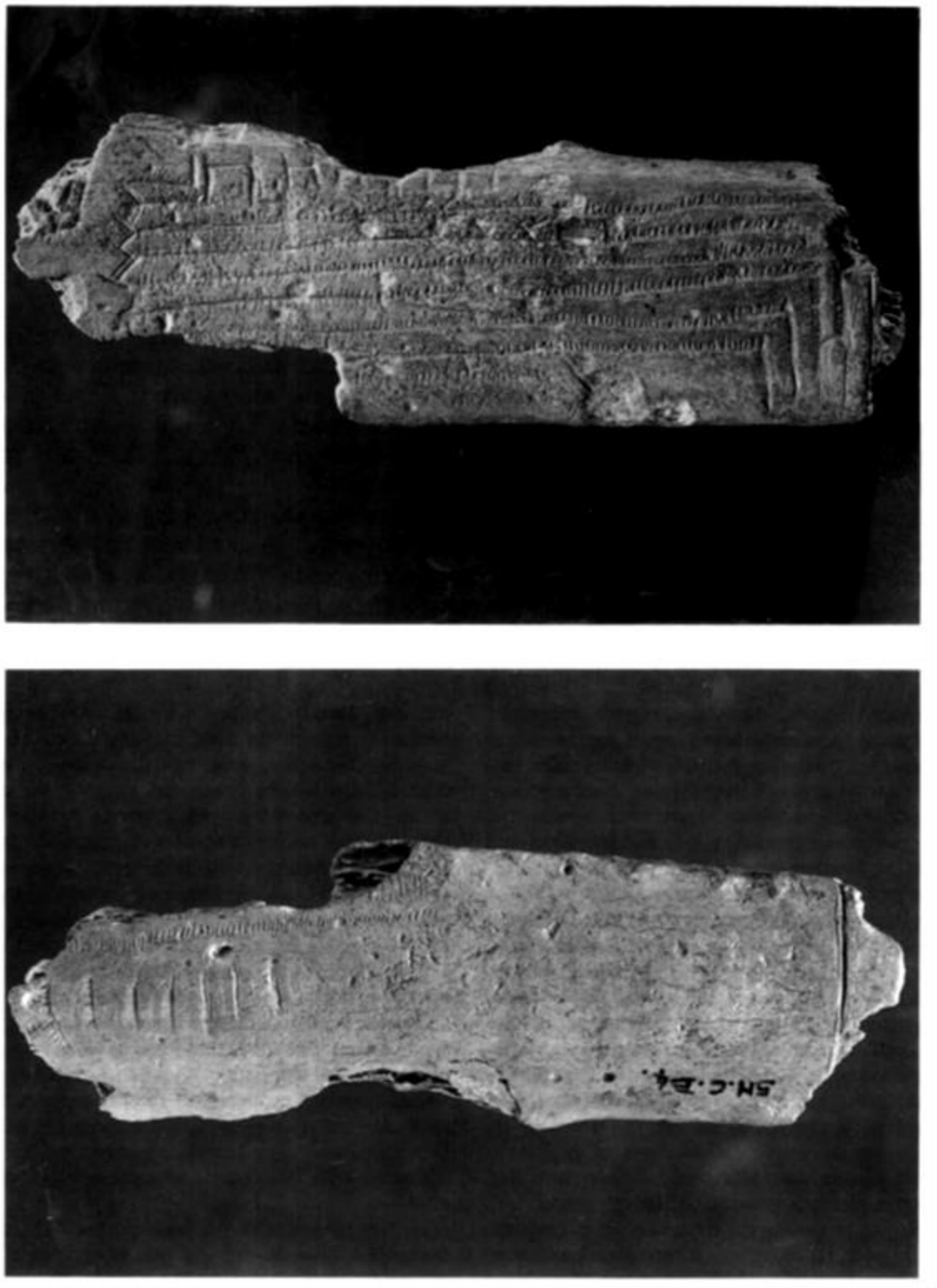


Figure 2.40: Photograph showing both sides of the Tai Plaque–an engraved rib bone from the Grotte du Tai, southwest France. The bone measures 8. 8cm long and dates to c. 10,000 BC placing it within the Terminal Magdalenian or Early Azilian culture. *Marshack suggests the notches* recorded non-arithmical observations of the lunar year, and also solstitial observations (Marshack 1991: fig. 1 p. 26).

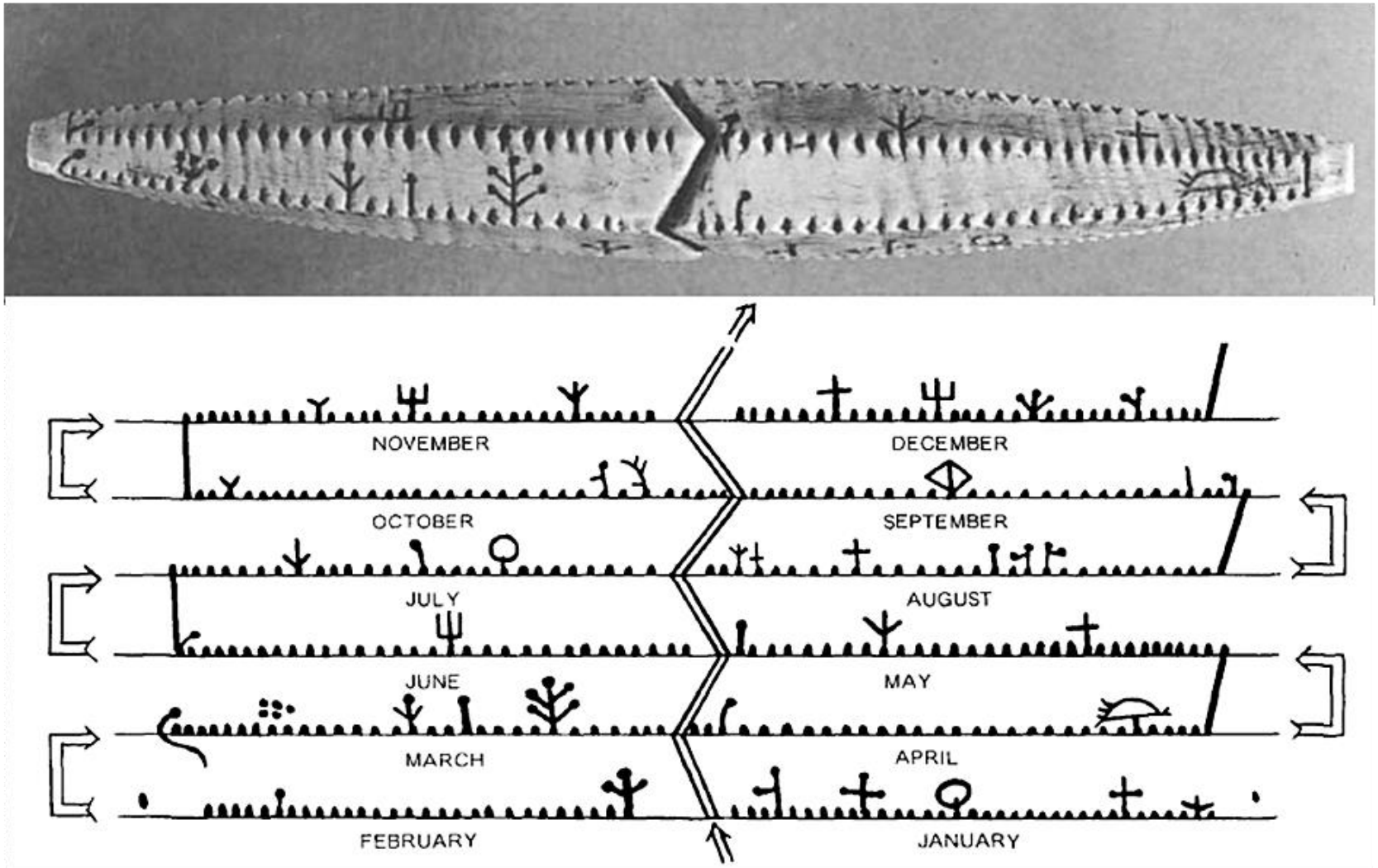


Figure 2.41: Photograph and detail of design a six-sided calendar stick of ivory. From the Yakut culture, Siberia. Dimensions: 17. 8 x 2.5 cm. The chart illustrates the detail of each side of the stick, with the addition of the calendar months. The stick is thought to record not only the calendar months, but important events within them (Marshack 1991: fig. 6 p. 32).

Figure 2.42: Chief Tshi-zun-hau-kau of the Winnebago Indians, Wisconsin. Painted in the 1820's. Tshi-zun-hau-kau holds a calendar stick-documenting the precise observational lunar year. The stick also contains intercalary months to bring it into phase with the solar year. (Marshack 1985: 30).

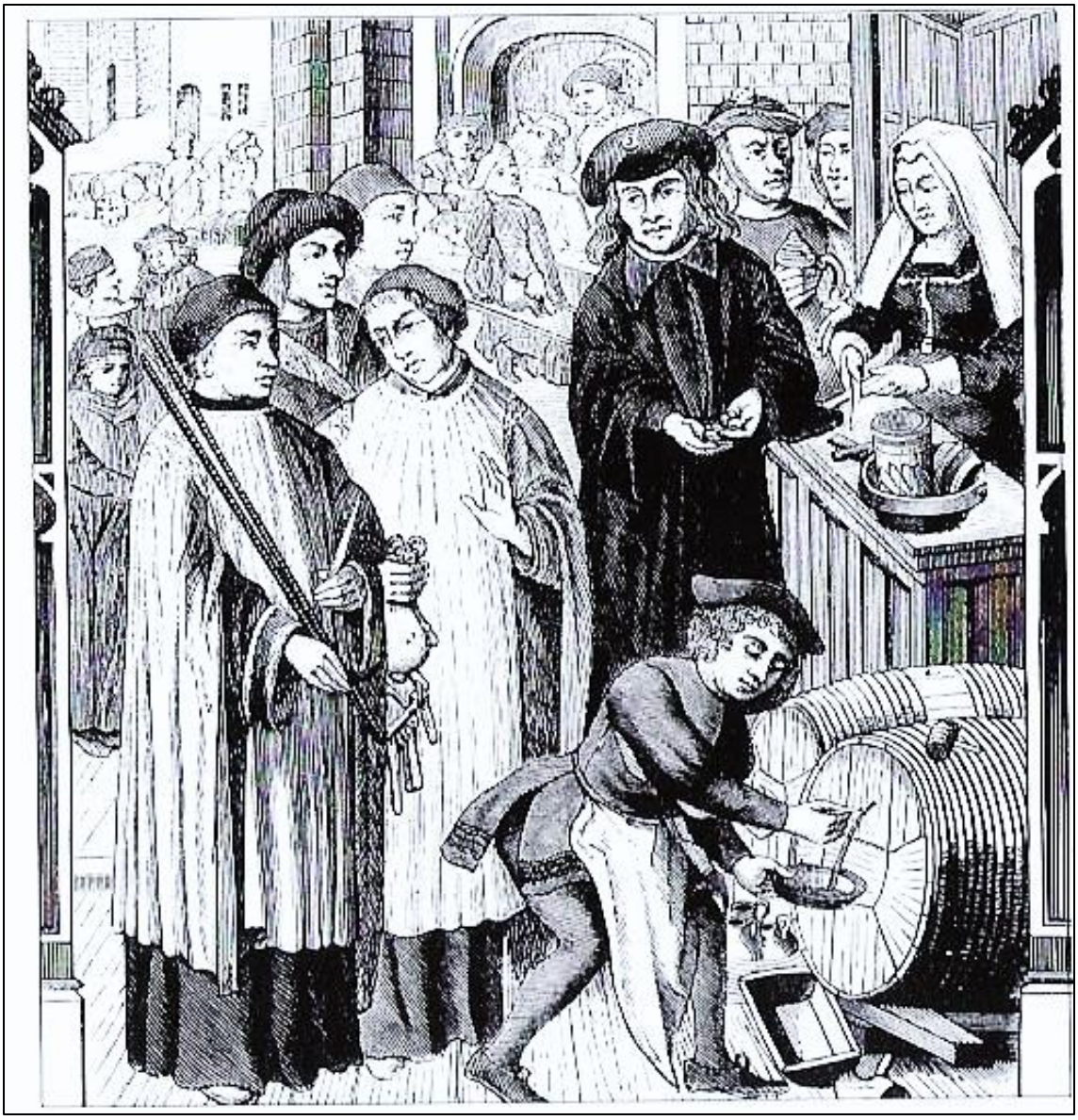


Figure 2.43: Image from an AD 15th century cathedral window in Tournai Cathedral, Belgium. The scene shows medieval customs officers collecting wine duties with the aid of wooden stick tallies. The officer on the left holds a pair of tallies along with a notching knife. The colleague to his right holds a purse to collect duties. (Robinson 2007: 54).

CHAPTER 3: THE NEOLITHIC OF THE NEAR EAST

3.1-INTRODUCTION

The Neolithic period in the Near East spans a considerable time period from the 10th to the 6th millennium cal. BC. For millennia, humans existed by hunting wild animals and collecting wild plants. The start of the Neolithic period marks "perhaps the most remarkable happening in our prehistory" (Gebauer & Price 1992: 1; also Price & Gebauer 1995: 3, Verhoeven 2011: 39 and Zeder 2011: 75). Exactly why, after such a long period of time (humans have been on Earth for at least 4 million years-a conservative estimate, and our species for 200,000 years) people decided to give up their mobile, hunting and gathering lifestyle in favour of a settled agricultural way of life is still a question of great interest and debate. This, along with exactly where and when farming first emerged, how it spread and the consequences this new life way , have been ongoing research questions in Near Eastern archaeology for at least the last 60 years (Byrd 2005b: 1; Price & Gebauer 1995: 3; Redman 1977: 523).

The Near East covers a vast geographical area (figure 3.1a, figure 4.1), incorporating a wide variety of environmental and climatic zones, yet despite this, the large region is united by shared features and developments. The Neolithic period in the Near East saw not only the onset of agriculture, but many associated long-term changes to the way of life: the appearance of the world's first sedentary, permanent, farming villages. With this development came significant changes in social structure, subsistence activities and artistic expression as humans negotiated new relationships with each other and the environment around them. The advent of farming (and the plethora of associated developments) which characterises the Neolithic, undeniably resulted in an irrevocable change in the course of human history. Humans' relationship with animals and with the environment changed significantly.

There is great debate over exactly when, why and how the various developments seen within the Neolithic occur, due to the complex nature of each, and the importance of the processes which emerged at this time. Explanations for the causes of the adoption of agriculture, along with associated developments have been sought for over a century (beginning with Roth 1887; Price & Gebauer 1995: 1). An almost endless list of the initial causes have been offered, ranging from competition, climate change, population

pressure, resource abundance, resource pressure, sedentism, the advent of storage, natural selection and big men (see table 1 in Price & Gebauer 1995. Also Keeley 1995: 244-45). An equally long and complex set of discussions have emerged concerning when and how agriculture emerged, and the associated effects it had on the way of life. The common characteristics of the Neolithic period are often referred to collectively as the "Neolithic Package"; a term first coined by Childe (1936), becoming popular amongst British archaeologists from the 1970's (due to Clarke 1973). More broadly speaking, until recently, it was generally assumed that the characteristics of the Neolithic were a "revolution", with a package of characteristics appearing simultaneously, suddenly and uniformly across all of West Asia (though there has always been controversy as to the exact details). There is now increasing evidence to suggest it is more likely that the so-called "Neolithic Revolution" (another term coined by Childe 1928) was more of a gradual and varied process, with humans adopting certain elements of the "package" and adapting to the resulting changes differently in different regions, environmental zones, and types of community across the Near Eastern Zone (Belfer-Cohen & Goring-Morris 2011: 89; Perrot 2000: 16;Watkins 2010; Verhoeven 2011: 76; Zeder 2011: 40). This interpretation is disputed by some (i.e. Byrd 2005a).

Within Neolithic archaeology, differing cultural terms, supposedly mirroring developments seen within the period (most obviously the development of pottery, see below) are used to break up the Neolithic into smaller time frames, making it easier to compare different settlements to each other, and evaluate the types of communities. Like the overall term, these sub-divisions often have blurred boundaries with communities adopting different technologies, economies and other characteristics of the Neolithic period, and at different times and speeds. Many hallmarks of the Neolithic are first evidenced in the proceeding Natufian period, and other Neolithic sites do not exhibit them at all. Therefore, this thesis focuses on the Neolithic as a period of time, in which the main characteristic of most of the communities within it is the presence of farming: culminating in the appearance of domesticated animals and plants; along with sedentism and permanent residential units leading to the appearance of villages, some of which reach unprecedented size. It must also be remembered that in this time frame, there were living groups of people that reacted differently to the developments of this vast region, many of which must have continued to live as they had for thousands of years, adopting only certain elements that define the Neolithic. What is important is that various people lived simultaneously, and though they shared many aspects of their

culture, significant differences existed, with diverse adaptations to the same set of circumstances seen. This needs to be borne in mind when considering a functional interpretation of clay objects. The "Neolithic" is not represented by a single, uniform type of settlement or community, and therefore a single, uniform function is unlikely.

Rather than provide a detailed and critical discussion of the debates surrounding why, when and how agriculture emerged in the Near East, this chapter serves as an introduction to the period and region, outlining the defining features and characteristics including the environment, sub-divisions within the period and their defining features. Following on, those aspects of the Neolithic which may have more relevance to the understanding of geometric clay objects will be discussed in more detail; aspects that relate to the functions discussed in Chapter 2, including subsistence strategies, storage, settlement structure, material culture and exchange networks.

3.2-ENVIRONMENT

OVERVIEW

The Near East (also commonly referred to as South West Asia) is a vast region, with a varied climate, environment and landforms. Located in between three land masses: Europe, Asia and Africa, today as in the in past, the zone has highly variable temperatures, rainfall, plant and animal resources (Bar-Yosef & Meadow 1995: 42). An understanding of the environment of the study area is vital to the research questions of this thesis, as climate and environment have a significant impact on the way people live, in the past as today. Any archaeological study therefore needs to take these factors into account, and for a study based at the time when many were transitioning to agriculture; environment, landscape and climate is even more important, impacting on the type of species present. The environment also dictates the abundance or scarcity of natural plant and animal resources, as well as the ability to farm, and techniques suitable. All of these factors had a significant effect on nature of the resultant communities.

3.2(a) GEOGRAPHIC FEATURES

The Near East displays a number of geographic features, ranging from plateaus, coastal plains, inland alluvial plains and mountains. In the north-west of the zone is the Anatolian Plateau, this large alluvial fan is bounded by mountain ranges; the Pontic Mountains in the north, and the Taurus Mountains to the south. Mesopotamia itself is defined as the land between the Tigris and Euphrates Rivers (Bar-Yosef & Meadow

1995: 43; Watson 1995: 27-30). The Levant is often seen as a special zone in the Near East. This relatively small region runs from the Taurus Mountains in the north to the Sinai Peninsula in the south, and from the Mediterranean coast in the west, to the Middle Euphrates Valley, the Gebel ed-Druz and the Palmyra, Azraq and El Jafr Basins (Bar-Yosef & Meadow 1995: 43, Bar-Yosef & Belfer-Cohen 1991: 21). The inland mountain ranges are cut by many wadis and the Orontes-Jordan Rift Valley (Bar-Yosef & Meadow 1995: 43; Bar-Yosef & Belfer-Cohen 1991: 21;, Garfinkel & Dag 2006: 4). The divergent geographic features outlined above already suggest a range of pathways and settlement types, with distinct subsistence strategies must have existed within the assortment of physical environments created by these geographical features (see below).

3.2(b) NATURAL RESOURCES

Evidence relating to past vegetation of the Near East comes from a variety of sources, yet the diverse nature of the regions makes palaeo-environmental reconstruction difficult; evidence from one source cannot necessarily be inferred as representative of the climate or changes in the climate of another zone. Therefore the study of a combination of local and regional evidence (sea water temperatures/deep sea cores, palynological sequences of inland lakes and geomorphological evidence) is necessary in order to reconstruct past physical environment and associated climate. Three main different vegetational areas are found within the large Mediterranean Zone; containing an abundance of plant and meat sources. The Mediterranean Levant is most rich in edible fruits, seeds and leaves (Bar-Yosef & Belfer-Cohen 1991: 23). The number of species represented, along with density of coverage decline eastward within the Mediterranean Zone, corresponding to an increase in temperature and decrease in water (Hovers 1997: 4). Fauna is most dense in the Mediterranean core also, with its open parklands abundant in animals, and the thick oak forests more sparse in animals (Bar-Yosef & Belfer-Cohen 1991: 23). Within Anatolia, the west is characterised by broad leafed and needle leafed trees along with cold resistant shrubs. The Anatolian Plateau along with the arching belt north of the Taurus and Zagros Mountain Zone is covered in dwarf shrub land and steppic vegetation whilst the Eastern Mountains and the Zagros zone of Anatolia exhibit deciduous, broad leafed, cold adapted woodland. In the drier, southern areas of the Near East, those with less than 300-400mm annual precipitation, open dwarf shrub land and desert plains typify the environment (Bar-Yosef & Meadow 1995: 43, Bar-Yosef & Belfer-Cohen 1991: 21).

3.2(c) CLIMATE

The Near East is presently dominated by two seasons: cold, rainy winters and hot, dry summers. It is generally warmer on the coast and colder inland and in areas of high elevation, yet within the Near East, there are great variations in precipitation and temperature, as well as large annual fluctuations in rainfall (Bar-Yosef & Meadow 1995: 43; Bar-Yosef & Belfer-Cohen 1991: 21). Precipitation depends on proximity to the sea, and elevation, with rainfall decreasing in the Levant the further south you travel, yet the driest areas are the Arabian Peninsula, and the Anatolia and Iranian Plateaus (Bar-Yosef & Meadow 1995: 43; Hovers 1997: 3)-(figure 3.1b). Non-irrigation agriculture is impossible for many sites without abundant water supplies from streams and rivers.

The most accurate evidence of past climate comes from the comparison of a range of sources (Bar-Yosef & Belfer-Cohen 1991: 22-23; Bar-Yosef & Meadow 1995: 44;; Garfinkel & Dag 2006: 6-7; Hovers 1997: 6-8), including Upper Pleistocene levels of Lake Lisan alongside deep sea cores (Bar-Yosef & Meadow 1995: 44). However, there is no space here to discuss the varied theories and lines of evidence along with the debates surrounding past climate, the disagreements regarding the validity of these sources, and climatic changes of the Near East. Instead, the basic, current consensus (provided by Akkermans *et al.* 2010; Banning *et al.* 2011; Bar-Yosef & Belfer-Cohen 1991; Bar-Yosef & Meadow 1995; Byrd 2005a; Clare *et al.* 2008; Maher, Moore & Hillman 1992; Weiss & Bradley 2001; Weninger *et al.* 2006 and Wright 1993) on conditions and temporal changes are outlined, with correlates to the cultural phases of the Epipalaeolithic and Neolithic.

The climate of the entire Near East region during the Late Glacial Maximum c. 24,000-16,000/14,000 BP (equivalent to the Kebaran period of the Early Epipalaeolithic) was cold and dry, with low sea levels and reduced woodland, cereal and legume distributions (Bar-Matthews *et al.*, 1997; Byrd 2005a: 242; Wright 1993: 466). However the Mediterranean coastal hills were still covered in forest, benefitting from winter rains. Sea levels were low but lakes were much larger than present. The Late Epipalaeolithic corresponds with the Natufian period (c. 12,500-10,500 BP), which saw climate change in the form of increased temperatures and precipitation, beginning 14,000 BP and peaking at 11,500 BP (the Early Natufian) the Bølling-Allerød or GI 1 (Byrd 2005a: 242; Moore & Hillman 1992: 483; Perrot 2002: 8). This period shows raised pollen counts, suggesting an increase in cereals and woodland c. 13,500-11,000 BP. This end of this phase then witnessed the start of the Younger Dryas (c.

11,000/10,800 to 10,300/10,000 BP; coinciding with the Late Natufian period), a short, sharp, cold and arid spell, resulting in a contraction of woodland. The Younger Dryas was a global phenomenon (Bar-Yosef & Belfer-Cohen 1991: 22; Bar-Yosef & Meadow 1995: 44; Byrd 2005a: 244; Maher, Banning *et al.* 2011: 8; Moore & Hillman 1992: 483; Perrot 2002: 8).

The Younger Dryas was followed by the onset of the Holocene c. 10,000 BP/9,700-9,500 cal. BC (equivalent to the start of the Pre Pottery Neolithic A, see below), which exhibited rapid climate changes in a few decades (Byrd 2005a: 242). All proxies suggest an increase in temperature, precipitation and humidity, resulting in an expansion of the distribution of woodland, cereals and pulses (Bar-Yosef & Belfer-Cohen 1991: 22, 33; Bar-Yosef & Meadow 1995: 44; Byrd 2005a: 244; Garfinkel & Dag 2006: 7). However rainfall did not return to pre-Younger Dryas levels, except for in Anatolia and the Zagros, where rainfall was now higher (yet it is likely pluvial conditions fluctuated during the Holocene). It is at the start of the Neolithic, in the Pre Pottery Neolithic A (henceforth PPNA), that as a result of the conditions of the Holocene, the first cultivars (wheat, barley and pulses) appear on woodland fringes. At c. 8,200 BP/6,225 BC, near the end of the Neolithic, an abrupt cold event peaked, as observed in ice cores, marine sediment cores, lacustrine and terrestrial records (Akkermans *et al.* 2010, Clare *et al.* 2008: 66-67). Climatic deterioration is commonly used to support evidence of social collapse across many time periods (for example Weiss & Bradley 2001, Weninger *et al.* 2006), however Akkermans *et al.* (2010) feel this explanation is an over simplification, as humans have strategies to manage and adapt at times of stress. Though the scale and possible effects of the Late Neolithic 6,200 cal. BC event are under investigation, it may be no coincidence that the timing of the event coincides with clear and sometimes dramatic changes in the nature of settlement at a number of long-lived Neolithic sites such as Tell Sabi Abyad, and marks the end of the Neolithic in some regions (see section 3.3(d) below). As seen in Chapter 2, clay objects do continue to be produced in post-Neolithic times, however perhaps their role changed, with their use in the Neolithic being unique to one of, or a combination of characteristic features of the Neolithic period.

At present, the limitations of the climate evidence make it difficult for people to agree on the precise nature of climate change, and human adaptations to it. However it is clear that the past climate of the Near East differed to that of today, and was diverse within the region. Many episodes of fluctuations in rainfall and temperature occurred,

having a direct and sometimes significant impact on the plant and animal resources available for exploitation. These fluctuations in climate would have most definitely impacted on subsistence strategies of both mobile and sedentary Neolithic peoples, and those economies based on hunting and gathering; likewise, the needs of early agriculturalists (as well as perhaps, those groups that resisted farming, or remained mobile) in terms of decision making, storage and resource management, resource procurement and exchange. In addition, the need to count, record and account for resources gathered, produced, stored, distributed and exchanged; or possibly the counting and/or recording of the number of workers, days, agricultural cycles or related factors are likely to have been impacted by these fluctuations, and in ways as diverse as the environments of the Neolithic Near East.

3.3-CHRONOLOGY & PERIODISATION

OVERVIEW

The Neolithic or "New Stone Age" is distinguished in name from the preceding Epipalaeolithic by the introduction of a wider range of new stone tool types. The first settled villages and the development of plant and animal domestication are the hallmarks of the Neolithic, and by the end of the period, the transition to agriculture and a settled way of life is complete (Gerard 2002: 108; Kuijt 2000b: 6; Thissen 2002: 19). Although covering a large geographical area, and displaying regional variations in terms of the nature and timing of specific developments, features and characteristics, in general, the entire Near Eastern zone shares many characteristic features, which define and unite the Near East under the term "Neolithic" (most notably the adoption of farming and a settled lifestyle).

Differences of opinion lie in the interpretation of the degree of homogeneity within the entire Neolithic zone of the Near East, and the degree of difference found within it. The chronology established by Dame Kathleen Kenyon (1983, 1982, 1981a, 1981b, 1965, 1960), as a result of her 1950's research at the south Levantine site of Jericho, divides the Neolithic period into two: "pre" and "post" pottery stages. The first, the pre-pottery phase is further divided into A and B. There is a lack of consensus of the exact calendar dates that define each period with different dates being proposed for northern and southern regions in some phases of the Neolithic. Table 3.1 is provided as a guide only, and regional specific chronologies should also be consulted (Akkermans & Schwartz 2003: figs 3. 2 & 4. 2; Garfinkel & Ben-Shlomo 2002: 71; Gerard 2002: 108; Gopher &

Gophna 1993: 306; Kuijt 2000b: 5, 6, 8, fig. 3 p. 9; Kuijt & Goring-Morris 2002: table 1; Özdoğan & Basgelen 2007: insert; Rollefson *et al.* 1992: 447).

In Anatolia, discussions have been undertaken regarding the proposed creation of a chronological scheme more suited to the region (Thissen 2002; Özdoğan & Basgelen 2007). Traditionally, within Anatolia, the same (or an adapted) Levantine system (Pre Pottery Neolithic A, PPNB etc.) has been applied. Alternatively three simple divisions are made, the "Late Epi-Palaeolithic" (corresponding to the Natufian of the Levant), the "Aceramic Neolithic" and "Ceramic Neolithic" (the latter two of which may be further divided into Early and Late) (Marciniak & Czerniak 2007: fig 1a p. 116; Özbaşaran & Buitenhuis 2002: especially table 2 p. 69). Alternative Anatolian specific chronological systems have been proposed, which cover the entire period from the end of the Pleistocene to the mid-Chalcolithic as the "Early Central Anatolian I-V" (as proposed by Özbaşaran & Buitenhuis 2002: table 2 p. 69. Similarly by Matthews in Özbaşaran & Buitenhuis 2002: table 1 p. 68). This perceived need for a separate Anatolian chronology is due to the large amount of new data from excavations in the region from the 1990's ongoing. The new data, when considered together, highlight differences in the presence, development and timing of some characteristic Neolithic developments, making the conventional chronological terminology, developed initial for the Levantine zone, insufficient for the Central Anatolian Neolithic (Gerard & Thissen 2002: 2; Özbaşaran & Buitenhuis 2002: 67).

There are a number of regional specific phases within the Neolithic period which display subtle yet important differences in their sequences (Kuijt 2000b: 8, fig 3 p. 9), an example being the Pre-Pottery Neolithic C, which is only found in the southern Levant (Gopher & Gophna 1993: 306; Kuijt 2000b: 5, 6; Nissen 1993; Perrot 1993; Rollefson *et al.* 1992: 446; Rollefson & Köhler-Rollefson 1989; Rollefson & Köhler-Rollefson 1993; Simmons 2000: 212). A detailed discussion of the features of the Neolithic follow later in this chapter, presented below is a generalised summary of the conventional sub-periods of the Neolithic.

3.3(a) NEOLITHIC BEGINNINGS

The PPNA & PPNB

The Neolithic period begins with the Pre-Pottery Neolithic A, which emerged around 11,500 years ago (see table 3.1). Characterised by fully sedentary villages, PPNA settlements are typified by sites which display permanent, year round occupation in

curvilinear houses, and a mixed subsistence strategy which relied largely on the gathering and cultivation of morphologically wild plants, as well as the hunting of wild animals (Akkermans & Schwartz 2003: 45; Garfinkel & Ben-Shlomo 2002: 71; Kuijt 2000b: 6, 8; Kuijt & Goring-Morris 2002: table 1; Özdoğan & Basgelen 2007: insert). This stage is followed by the Pre-Pottery Neolithic B period (henceforth PPNB) which evidences the development of larger, more densely packed agricultural villages, and an intensification of plant and animal management strategies with the beginnings of domestication (see below) and is characterised by settlements with largely rectilinear architecture. This long period spanning approximately 8,550 to 7,650 cal. BC is subdivided into the Early, Middle and Late PPNB in the Levant (table 3.1. Akkermans & Schwartz 2003: figs. 3. 2 & 4. 2; Kuijt 2000b: 6, 8; Özdoğan & Basgelen 2007: insert; Rollefson *et al.* 1992: 447).

Regional Variants & Issues

Within the PPNA are some regional specific cultural variants, such as the Mureybetian in the Upper Euphrates, yet these entities are very similar to that of the PPNA of the Levant. Within the southern part of the Levant, some scholars sub-divide the PPNA time-frame into two periods based on lithic assemblages. The Early PPNA of the southern Levant can be referred to as the "Khiamian" Phase and the Later PPNA as the "Sultanian" Phase (e.g. Bar-Yosef & Belfer-Cohen 1991: 33-34; Bar-Yosef, Gopher & Goring-Morris 1980; Cauvin 2000; Crowfoot-Payne 1976 Goring-Morris & Belfer-Cohen 1997: table 1 p. 75;). It has been claimed the Khiamian was not the start of the PPNA proper, but marks a transitional phase seeing the "disintegration of a Final Natufian way of life" (Finlayson, Mithen & Smith 2011: 127). Some argue that the Khiamian sees settlement dislocation and the brief return to a hunter-gather lifestyle, before "the 'real' beginning of the Neolithic and village life" (Finlayson, Mithen & Smith 2011: 127). In this opinion, the "real" Neolithic is marked by the onset of the Sultanian Period of the later PPNA (argued by Byrd 2005a; Cauvin 2000; Goring-Morris & Belfer-Cohen 1997). Though supported by many academics, this internal South Levant PPNA divide is increasingly being disregarded on the basis of unclear distinctions between the two phases, and the overlap of c14 dates across the two sub-phases (i.e. Edwards *et al.* 2004; Garfinkel 1996, Edwards *et al.* 2004; Nadel 1990).

Though less extensively investigated archaeologically, the Aceramic of the North Mesopotamian plains and the Iranian Zagros Mountains, spanning the same time PPNA to PPNB period (approximately the start of the 10th millennium to the end of the 8th

millennium cal. BC) evidences sites which though exhibiting distinct regional developments, also share many similarities to the PPNA of the Levant. This includes sites such as PPNA equivalent Zawi Chemi Shanidar, M'Lefaat and Qermez Dere and PPNB comparable Nemrik, Jarmo and Maghzaliyeh (Betts, Baird & Watkins 1989; Dittemore 1983; Perkins 1964; Solecki 1981; Solecki & Solecki 1970; Watkins 1990 Watkins *et al.* 1991; Watkins, Dobney & Nesbitt 1995).

3.3(b) SOUTHERN LEVANT: THE PPNC & EARLY CERAMIC NEOLITHIC

PPNC

The introduction and widespread utilisation of pottery appears at differing times across the Near East; its presence characterises the latter stage of the Neolithic, from the 7th millennium cal. BC. The Pre-Pottery Neolithic C spans approximately c. 7,000-6,500/6,300 cal. BC in the southern Levant, and includes the so-called "Mega-Sites" of the West Jordan Valley such as 'Ain Ghazal and Wadi Shuʿeib (Garfinkel 2004; Galili *et al.* 1993; Rollefson & Köhler-Rollefson 1993). South Levantine mega-sites generally show a long and unbroken occupational sequence from the Middle-PPNB (MPPNB), right through into the ceramic period of the Neolithic (see table 3.1 for chronology). They are characterised by being over 10 hectares in size, displaying clear differences to the preceding Late-PPNB (LPPNB) in almost all aspects, architecture, mortuary practices and artefacts for example. Mega-sites are generally viewed as the Near East's first experiments in "large-scale communal living" (Gopher & Gophna 1993: 306; Rollefson, Simmons & Kafafi 1992: 447; Simmons 2000: 214-15, 223-224; Simmons *et al.* 2001). However the "mega" element of many of these so-called sites is debatable. By the end of the 8th/the start of 7th millennium BC, 'Ain Ghazal (on the outskirts of modern Amman, Jordan) is estimated to have reached up to 10 to 12 hectares. This is large in the context of the Neolithic, yet whether this figure represents the simultaneous occupation of the entire site is unclear. It is more likely that different parts of 'Ain Ghazal were occupied separately, at different points in time during the Neolithic (Rollefson *et al.* 1992: 446). Therefore the maximum size of occupation, of each mega-site at any given point time, would in fact be only a fraction of the estimated total maximum site size published, removing their "mega" status. Additionally, by comparison, Abu Hureyra in North Mesopotamia reaches its maximum size at 20 hectares during the Neolithic. .

The "Yarmukian" & Ceramic Neolithic in the Southern Levant

By the late 7th Millennium cal. BC, pottery is widespread and it is within this Pottery or Ceramic Neolithic phase (henceforth PN/CN) of the southern Levant Neolithic that the Yarmukian, often interpreted as a distinct, regional sub-culture of the PN, emerges. Discovered and coined by Stekelis (1972) during his excavations at Sha'ar Hagolan, the "culture" is largely restricted to sites in the west Jordan Valley (i.e. Tell Abu es-Suwwan, Wadi Shuʿeib and 'Ain Ghazal. See: Garfinkel 1999, Garfinkel & Miller 2002a, Gopher & Gophna 1993, al-Nahar pers. com., Rollefson & Kafafi 1985, Simmons *et al.* 2001). The 7th millennium BC in the southern Levant is often described as a declining period, a "turbulent time", which witnessed major changes in many aspects of culture (see for example Kenyon 1960: 67-68; Kirkbride 1971 in Garfinkel, Miller 2002b: 1). However, since Kenyon and Kirkbride, the PPNC phases of the "mega-sites" can be used to disprove this theory. The more common consensus is now one of continuation from the PPNC, into the Yarmukian and the early 6th millennium (Campbell 2011: 173-183, Campbell 2010).

3.3(c) EARLY CERAMIC NEOLITHIC OF ANATOLIA & THE NORTHERN LEVANT

Anatolia and Upper Mesopotamia flourish in the 7th and 6th millennium BC. The region sees the earliest introduction of pottery in the Near East, at the very start of the 7th millennium BC. Pottery is immediately widespread, thus the transition into the 7th millennium BC marks the onset of the Ceramic Neolithic period in this zone (Garfinkel & Epstein 1999: 11-12; Nieuwenhuyse, Akkermans & van der Plicht 2010: 72). The Ceramic Neolithic of Upper Mesopotamia (including Anatolia) sees the flourishing of a number of regional phenomena represented by the Hassuna, Samara and Halaf "cultures".

"Hassuna" & "Samarra"

Dated to the latter half of the 7th millennium (table 3.1), both Tell Hassuna and Tell Samarra are characterised by the presence of distinctive painted pottery wares, the earliest in the Near East. The Hassuna and Samarra cultures overlap in time, and there is still debate surrounding their exact definitions, distinctions and whether they really are variations of the same culture. The latter scenario appears more likely as recent work at the Turkish site of Hakemi Use for example, has yielded large quantities of Hassuna-Samarra sherds. Aside from the distinctive pottery styles of this culture, there is little else that defines and marks it out as different from the proceeding Ceramic

Neolithic periods (see for example: Tekin 2005; also: Braidwood, Braidwood & Haines 1960, and Iwasaki, Nishino & Tsuneki 1995).

6,225 cal. BC Abrupt Cold Event

An abrupt cold event climax occurred towards the end of the 7th millennium BC in the Near East c. 8,200 BP/6,225 BC (Akkermans *et al.* 2010, Clare *et al.* 2008: 66-67). Its extent and effects on the prehistoric societies are not yet adequately understood, however this particular episode does appear to correspond with clear changes within some Neolithic communities. Tell Sabi Abyad in Upper Mesopotamia for example, shows key changes in subsistence strategies, as well as distinct changes in architecture, community organisation and material culture during the 8.2ka event, yet occupation continued (Akkermans *et al.* 2010). Similarly, Lee and DeVore (1968) have argued that adaptations and reactions to climatic deterioration caused tensions within communities, with Hacilar, Höyücek, Kuruçay and Bademağacı all cited as showing evidence of warfare at that time (Clare *et al.* 2008: 73).

3.3(d) LATE CERAMIC NEOLITHIC: THE "HALAF" & THE END OF THE NEOLITHIC

The Halaf emerges from the preceding Hassuna-Samarra, spanning much of the 6th millennium BC in Upper Mesopotamia and the surrounding zone (table 3.1). By this point in time, the Neolithic had ended, being replaced by the following "Chalcolithic" or Copper Age in many parts of the Near East (Gerard 2002: 108). Covering a much wider area of Mesopotamia in comparison to the proceeding Hassuna-Samarra (figure 3.2), the Halaf is a largely arbitrary designation (named after the type site of Tell Halaf) based on the extreme cultural continuity over a large horizontal band in the north of West Asia (Campbell 2007-2008: 125; Özbal *et al.* 2004: 37; Von Oppenheim 1962, Von Oppenheim 1950-55; Von Oppenheim 1943; Von Oppenheim 1931). Most scholars argue the Halaf region of Upper Mesopotamia in the 6th millennium BC saw remarkable cultural continuity over a vast area, lasting for a significant period of time and primarily characterised by distinctive, fine painted wares. In addition to the pottery, Halaf sites display a number of homogeneous features: namely the presence of stamp seals and sealings, clay objects, storage facilities and a combination of rectilinear and round (tholoi) domestic structures which are found in various combinations across the Halaf sites (including: Domuztepe, Tell Arpachiyah, Tell Sabi Abyad I, Yarim Tepe and Kharabeh Shattani. Ssee for example: Akkermans 1993a, Akkermans & Verhoeven 1995, Campbell 2000a, Campbell 2000b, Campbell *et al.* 1999, Carter, Campbell & Gauld 2003, Mallowan & Cruikshank Rose 1935). The Halaf was a critical time period,

emerging from a background of small farming villages, leading into urbanism and complex society by the 4th millennium BC (Campbell 2000b: 1).

As a result of the issues outlined above, the use of cultural terminology to define periods of time will be avoided for the rest of this thesis. When referring to objects, settlements or events within specific temporal periods of the Neolithic, millennia or parts thereof, in years calibrated BC will be given. The use of definite calendar dates will be avoided, as these are rarely accurate to more than +/-200 years. This method will allow different sites and features within them to be compared more accurately, and without the bias and constraints of the use of cultural terminology. Only when publications provide a cultural period, and the broader timeframe being referred to, the millennia or part thereof is uncertain, will cultural periods be used.

3.4-THE NEOLITHIC-DEFINING FEATURES

The transition of modern humans from a mobile way of life surviving by the collection of wild plants and the hunting of wild animals, to a settled agricultural village lifestyle marks a pivotal shift, and is one of the major events in prehistory along with the appearance of modern humans and the rise of hierarchical society (Gebauer & Price 1992: 1; Price & Gebauer 1995: 3; Verhoeven 2011: 78; Zeder 2011: 39; Hole 2000: 191). This transition was witnessed for the first time in human history, in the Near East, over a relatively short time. From there, agriculture began to spread; China, South East Asia, Mesoamerica, South America and the Eastern United States soon moved away from a mobile hunting, to a settled agricultural life (Gebauer & Price 1992; Price & Gebauer 1995: 3; Zohary & Hopf 2000: 243).

3.4(a) THE "NEOLITHIC PACKAGE"

Along with the change in subsistence came numerous new features and developments, which are often collectively referred to as the Neolithic "Package" (Finlayson, Hole 2000: 194; Kuijt *et al.* 2011: 126; Verhoeven 2011: 78). Like the reasons for the transitions to agriculture, the associated developments, the order in which these features appeared, and their consequences are also debated; with some scholars citing particular features as the necessary pre-requites to agriculture (and thus some appear to develop before the onset of the Neolithic period), and others citing the same development as a result of the transition (Verhoeven 2011: 78-84). Sedentism is perhaps the most characteristic element of the Neolithic period with permanent villages exhibiting year round occupation (Hayden 1995: 277-78; Verhoeven 2011: 7;).

Storage is also often cited as an accompanying factor, as farmers, it is assumed, had the capacity to amass a surplus, in order to store for consumption out of season (Finlayson, Kuijt *et al.* 2011: 129-30; Hayden 1995: 277-78; Kuijt 2011: 138; Umurtak 2007: 1 Verhoeven 2011: 78).

Cognitive changes within the human brain are often cited as being necessary to enable the transition to agriculture, argued as happening at the start of the Neolithic or earlier in the Palaeolithic. Cognitive change can be interpreted in different ways: changes in symbolic thinking, conceptual thinking, or changes in the structure and operation of the brain. Seeking an explanation for the many changes characteristic of the Neolithic period, Watkins (2010) disputes Gordon Childe's (1928, 1936) assertion that the "pivotal agent of change" during the so-called "Neolithic Revolution" was its economy. Watkins instead argues that "cultural and cognitive" changes were more important (2010: 621, 622, 631-32). Cauvin (2001) also argues against Childe, again in favour of cognition as an explanation for the Neolithic, defining his own theory on the origins of agriculture as highlighting "the importance of cognitive factors, and the socio-cultural changes which result there from, as the principal motivation for the "Neolithic Revolution" (2001: 106). In his *The Birth of the Gods and the Origins of Agriculture* (2000) Cauvin names the so-called "Revolution of Symbols" as key to the development of agriculture in the Neolithic period. However, interlinked with this theory, is the idea of cognitive change at the start of the Neolithic, enabling this Revolution of Symbols to take place (Cauvin 2000: 23, 208-09). Cauvin interprets cognitive change as a change in the way people conceptualise things, not neurological changes (Cauvin 2000: 208-09), claiming the "cognitive aspect of the *Revolution of Symbols* is fundamental" (Cauvin 2000: 209). Renfrew (1998) also stresses the importance of cognitive change in explaining the transition into (and also during) the Neolithic period. In opposition, Wengrow (2011), speaking of Cauvin's Revolution of Symbols" theory, refutes his claims of a "cognitive" and "Psycho-cultural" revolution, dismissing it as having no validation (2011: 154).

Mithen (1996) also attributes changes in the way prehistoric people thought as key to the transition into farming (1996: 256-58). He argues that once people developed the ability to think of plants and animals as "beings with whom 'social' relationships could be established", they could domesticate them (Mithen 1996: 256). Outside of the sphere of Near Eastern archaeology, Donald (1991) defines cognitive change as fundamental changes in the structure of the brain. He postulates that during the course of human

evolution, three major cognitive "steps" were taken. The third, the invention of permanent visual symbols began in the Upper Palaeolithic (Donald 1991: 273, 290), prompted by an increase in size of the cerebrum, which enabled increased and rapid cultural innovation "leading to Neolithic culture" (1991: 122).

Many view the explosion in symbolism seen throughout the Neolithic period and reflected in both material culture and "art" (i.e. wall paintings, large scale sculpture and architectural elaboration/installations) as a result of the change in relationships between humans, animals and the natural world (Hodder 2011; Peters & Schmidt 2004: 180). Likewise, a significant increase in symbolic ritual practice is reflected in various mediums: burial practices, large "communal", "corporate" or "ritual" buildings and a proliferation of "cult" or ritual artefacts (Verhoeven 2011: 81-82). Demographic growth is a more contentious component of the Neolithic "package", theorised that as people begin to live together in sedentary villages for the first time; the size of villages grows substantially, along with their populations which can reach into the thousands (Hayden 1995: 277-78; Peters & Schmidt 2004: 180; Rollefson *et al.* 1992; Simmons *et al.* 2001). Not all settlements adopted all features of the "package", nor are they present in a uniform way. It is the combination of elements which characterises the Neolithic, yet diversity is yet another hallmark of the period, with different combinations of elements seen in different regions through time.

3.4(b) NEOLITHIC PARADIGMS

The main domesticates of South West Asia continue to be the basis of many economies around the world today. Over the last 100 years (beginning two centuries ago with Roth's (1887) *On the Origin of Agriculture,* and more intensively in the last 60 years, a myriad of theories seeking to explain the causes and effects of the transition to agriculture have been advanced, none of which have sufficiently resolved the issue. The main theories revolve around issues related to climate change, population growth, sedentism, symbolic revolution, natural selection, competition and big men (Gebauer & Price 1992: tbl. 1 p. 2). The impetus for the transition is contested, with external push models, internal pull models, human agency and social factors all being proposed (i.e. Bender 1978, Braidwood 1960a, Cauvin 2000, Childe 1936, Hayden 1990, Zeder 2011: 40-42). Even the rate of change is not agreed on with the topic generally interpreted as a "revolution" yet now more often assumed to have been a slow process, taking thousands of years to complete (Belfer-Cohen & Goring-Morris 2011: 89; Watkins 2010; Verhoeven 2011: 76; Zeder 2011: 40). The nature and speed of these

developments are relevant in terms of the reason for the appearance of geometric clay objects at the start of the Neolithic period, and their interpretation during this entire epoch. The most influential trends are outlined historically below (see also table 3.2).

Childe in *The Most Ancient Near East* (1928) and *Man Makes Himself* (1936) introduced the "Oasis Theory". He hypothesised that due to desiccation, human populations along with wild animals were forced to congregate at the few available water sources (the river valleys and oases of the Near East). This forced restricted mobility, resulting in competition between humans, also between humans and animals, leading to animal husbandry and eventually animal domestication, along with the cultivation and domestication of plants for survival. Childe's breakthrough theory was however based on a number of incorrect assumptions and new research into climate change during the 1950's contradicted his argument. Robert Braidwood (1960a) rejected climate evidence, claiming technological innovations were key. Evidence from Jarmo proved that the wild ancestors of the first domesticates were found in the Hilly Flanks, and had restricted habitats in "Nuclear Zones" (Gebauer & Price 1992: 2; Verhoeven 2011: 76, Watson 1995: 23; Zeder 2001: 41). In order to exploit the wild resources, people "settled in" to these regions (Watson 1995: 25). Once technology and culture was "ready" and humans had become "familiar" with the species around them, they began to herd animals and cultivate plants, they then went on to domesticate them resulting eventually in farming villages (Gebauer & Price 1992: 2; Verhoeven 2011: 76; Watson 1995: 23; Zeder 2001: 41).

With the current anthropological evidence suggesting that hunter-gatherers were not living hand to mouth, Lee and DeVore (1968) and Lewis Binford (1968) concluded the environment at the time of the origin of agriculture was a picture of resource abundance (Binford 1968; Watson 1995: 26). In this circumstance, Binford theorised human groups would naturally become less mobile after time. This coupled with the corresponding increase in population would place a strain on resources and relations, forcing some groups to move into less resource rich or "Marginal Zones" where people were forced to herd animals and cultivate crops out of necessity, taking seeds and animals with them from the optimal zones (Verhoeven 2011: 76; Watson 1995: 26; Zeder 2011: 41). Perrot (1977) introduces a similar model, yet with more emphasis on man's technological skills. Barbara Bender's (1978) "Social Theory" theorised that the possession of a surplus of food could be used by those in authority in order to manipulate others into carrying out tasks (such as construction, providing a marriage

partner, taking part in ceremonies and so on) or be traded for more valued items such as rare stones or shells (Gebauer & Price 1992: 3; Zeder 2011: 42).

In a similar vein, Brian Hayden's 1990 model claimed ambitious "accumulators" or "Big Men", especially in resource rich areas (where there was little or no obligation to share) could amass or take control of surplus food; holding feasts in order to maintain their status and power (Gebauer & Price 1992: 3; Hayden 1990; Zeder 2011: 42). Lastly, Jacques Cauvin's (2000, 1994) contribution is still shaping research on the topic today. His radical view represents a departure from all previous models, rejecting the dominant theories, which in Cauvin's opinion, all, in one way or another, unadvisedly seek an economic explanation for the origins of agriculture (Cauvin 2000: 220; Hodder 2011: 112; Zeder 2011: 39). Cauvin claims that as Palaeolithic people were dominated by nature and Neolithic people dominated *it* by developing agriculture, a symbolic and cultural revolution *must* have preceded the later economic revolution that brought about agriculture in the Neolithic Near East (Verhoeven 2011: 75). To Cauvin, the "Revolution of Symbols" as expressed in all aspects of Neolithic material culture (architecture, iconography, ritual practice ad even lithic technology), and it's timing before the agricultural "revolution" was crucial, and a necessary pre-requisite to the transition into sedentary, agricultural village life (Cauvin 2000; Hodder 2011: 112; Zeder 2011: 40). Cauvin perceives this development as a "radical change in the collective psychology which must have preceded and engendered all the others" (Cauvin 2000: 23; Zeder 2011: 40). He does, however, admit that the symbolic and economic spheres are equally important in explaining the Neolithic transition to agriculture (Cauvin 2000: 220; Belfer-Cohen & Goring-Morris 2011: 89).

It is in this complex context that we are challenged with attempting to understand the function of small, rudimentary clay objects. Debates surrounding the causes of the Neolithic "Revolution "are important as they highlight and breakdown individual elements of the Neolithic "package". Those stressing the importance of symbolism open up the idea of clay objects as being just one small part of the ritual repertoire while those more focused on farming and its organisation may help tie the use of clay objects into the administrative sphere. All elements of the "Neolithic package" are inexorably interlinked to the advent of agriculture. As such, the process of the transition to agriculture is considered in detail below. Discussion of other elements of the package will also follow.

3.4(c) AGRICULTURE: ISSUES & DEFINITIONS

The identification of domestication is not a straight forward issue. Until very recently there has been great debate as to what factors can be used to recognise a domestic species and how reliably identifiable domestic species are (alongside less prevalent issues to what actually constitutes a domestic animal or plant). Along with this there are differences in the terminology used to describe different stages of the process, as well as difficulties in recognition of these. Here cultivation of plants is defined as human manipulation of wild species (wild plant cultivation activities including tillage, weeding and sowing) and domestication interpreted as the evolution of morphological changes making plants dependent on humans for reproduction. The two are distinct processes. Domestication is often easier to conclusively identify, and proves cultivation occurred before; however the amount of time between visible domestication and the beginnings of herding or cultivation are also debated. Likewise herded animals are those under human control, managed and manipulated yet at the beginning of this behaviour still morphologically wild, contrasting to domestic animals which like domestic plants, show distinct morphological differences to their wild counterparts and are dependent on humans. However the control of animals is not easy to identify and may be termed purely as the penning of wild animals, or the selective culling of loose and wild (i.e. un-penned) animals of a certain age or sex in order to prevent the depletion of wild stock. Like the terminology, the actual identification of morphological changes in plants and animals has also been a contentious issue (see for example Kuhn 1991: 59-60); however the intense research undertaken into the issue of domestication in recent years has served to clarify the main issues above.

Earliest Domesticates in the Near East

The earliest agricultural economies in the Near East were based on the domestication of emmer wheat, einkorn wheat, barley, pea, chick pea and lentil, along with caprine and cattle. The domestication of swine appears to have happened slightly later (Moore 1989: 620). Cereals are the principal founder crops of most civilisations, thriving in open ground and prized for their high nutritional content (Zohary & Hopf 2000: 19). Both wheat and barley are definitely domesticated from the second half of the 9th millennium cal. BC in the Near East Fertile Crescent, being found at Abu Hureyra, Cayönü, Cafer Höyük, Nevalı Çori, Tell Aswad and Jericho (Zohary & Hopf 2000: 16, 41, 216, 217). Alongside cereals, legumes are found at most early farming sites. Notably lentil and pea as well as chick pea, bitter vetch and grass pea (Zohary & Hopf 2000: 92, 242). The *when* and *where* of domestication is of great importance to the study of clay

objects, especially when considering Schmandt-Besserat's "token" theory which claims a) hunter-gatherers had no need to count or record, b) this need only appeared with the introduction of agriculture, c) the need (and correspondingly the number and range of types of clay objects) increased with the range of domesticated plant and animal species present (see Chapter 2.3 & 2.4.4) (1996, 1992a, 1992b).

3.4(d) PLANT CULTIVATION & DOMESTICATION

(i) Overview: issues, methods & identification

The maintenance of domesticated food plants is generally agreed to be highly labour intensive in comparison to simply gathering abundant, local plant species. However, before this, cultivation of morphologically wild plants may not necessarily have required much more energy expenditure than gathering, depending on the exact form it took on, and the environment in which it was enacted. The cultivation of plants can be difficult to recognise archaeologically and can be generally inferred by the presence of a combination of indicators. The presence of plant species outside of their natural habitat, and unnatural plant associations can suggest the deliberate movement of plants by humans. As many cultivated plant species grow in much more dense stands than their wild counterparts, the presence of large numbers of a particular seed or grain (such as being found on site in storage for example) is another indicator often cited as evidence of cultivation, especially when the cereal or grain in question is a low yield species (such as lentils. See Zeder 2011: 44; Weiss, Kislev & Hartmann 2006). Lastly, the presence of agricultural tools, plant processing tools and equipment may also indicate cultivation. Sites with significant proportions of sickle blades for example, especially those showing gloss from use in harvesting is often taken as evidence of the cultivation of plants. With all three of these lines of evidence there is of course disagreement over the interpretation of their presence archaeologically. It can be argued that the blades for example, even those showing gloss could be indicative of other activities. Likewise, in good years, large stores of seeds or grains could be amassed by simple gathering.

Morphologically domestic cereals are most readily recognised as showing a reduction of awns, increase size of grain, a reduction in glume thickness, an increase in seed production and most typically the presence of a tough rachis with domestic cereals reliant on human assistance for the seeds to be released (Zeder 2011: 43; Zohary & Hopf 2000: 19). The main signs of pulse domestication are similar, with a retention of

the seed in the pod, the loss of wild seed type dormancy and a considerable increase in seed size compared to wild forms (Zeder 2011: 44; Zohary & Hopf 2000: 93-94).

Current research suggests the appearance of archaeologically recognisable, morphological changes in the founder plant crops is not a straight forward matter and early farming practices may not have encouraged morphological change in cereal dispersal mechanisms (loss of brittle rachis. (Zeder 2011: 44). The stage at which morphological change occurs in plants, and the time period after domestication, by which morphological change is visible archaeologically may be up to 1,000 years after the initial change took place (Weiss, Kislev & Hartmann 2006; Zeder 2011: 44). Recent research has proved the presence of tough rachis in some wild cereals too, therefore at least 10% of grains need a tough rachis in order to claim the presence of domestic cereals (Zeder 2011: 43). Since this discovery, many archaeologists (i.e. Zeder 2011) have eliminated all previous PPNA candidates of morphologically domestic cereals and the southern Levant is no longer clearly the first place in which domestic cereals appear (Zeder 2011: 43) as had often suggested (i.e. by Bar-Yosef & Meadow 1995).

(ii) Cultivation Evidence

Contentious evidence of plant cultivation dates back to the Natufian, where plant processing tools in the form of large ground stone items (mortars and pestles most commonly) appear at a number of sites (Bar-Yosef; Goren 1973: 53, 54, 63, fig. 10, tbl. 5; Byrd 1987: 161, 178; Dubreuil 2004; Nadel & Lengyel 2009; Wright 1991: 19, 21, 28, 31, 34-35, table 5; Wright 1994). The presence of rye at Late Natufian Abu Hureyra, outside of its natural habitat and in significant quantities adds weight to the idea that perhaps experiments in cultivation may have begun before the Neolithic period (Hillman, Colledge & Harris 1989; Moore, Hillman & Legge 2000). Cultivated pulses are clearly attested from the PPNA, namely at Netiv Hagdud and Jerf-el-Ahmar. Both sites have hundreds of lentils showing they were clearly tended, transported and stored (Zeder 2011: 44). Wild lentil plants are rare, and their yield is very low, thus when wild lentils are found in stores of hundreds or thousands, cultivation is the only explanation (Tanno & Willcox 2006; Weiss, Kislev & Hartmann 2006; Willcox, Fornite & Herveux 2008; Zeder 2011: 44). Large stores of both chick pea and broad bean occur at many sites in the Middle Euphrates from the Early PPNB (Tanno & Willcox 2006) and similar evidence of cultivated pulses comes from Late PPNB Yiftahel (c. 8,800 cal. BP) where more than one million lentils were recovered in one bin (Weiss, Kislev & Hartmann

2006). It seems highly unlikely such a large number could have been amassed through cultivation alone (Weiss, Kislev & Hartmann 2006; Zeder 2011: 44).

(iii) Domestication Evidence

The earliest claimed evidence of plant domestication comes from the PPNA site of Iraq-ed Dubb, where wheat and barley, dated to 9,000 cal. BC have been interpreted as domestic based on the evidence of tough rachis wheat and enlarged barley grains. This claim has caused disagreement as there are no other claims of PPNA cereal domestication, with domesticated cereals not becoming widespread until the start of the PPNB in the 8th to 7th millennium cal. BC (Asouti & Fuller 2012: 153, Tanno & Willcox 2006, Nesbitt 2002). However, the context of plants in the Neolithic, does in itself show that cultivation must have been happening in the Near East throughout the PPNA. Cereals occur in abundance outside of their natural habitat, and alongside these are found complexes of weed species typical of fields under cultivation. Wild einkorn grains show a subtle, slow, yet definite increase in plumpness and there is a corresponding (also slow and subtle) decrease in indigenous plants in favour of wild, non-local species (the founder crops) (Zeder 2011: 44). By the EPPNB in the Upper Euphrates Valley (c. 10,500-10,200 BP cal.) clear, securely dated evidence of morphologically domestic cereals is available in the form of emmer and einkorn. Similar evidence comes from Nevalı Çori, Cafer Höyük and also Çayönü (Zeder 2011: 43). Barley, definitively identified and from secure contexts is not seen until the MPPNB, where it is found at sites across the Anatolian Plateau and the Fertile Crescent (Nesbitt 2002). Aside from founder crops, early plant cultivation in the Near East also included fruits, such as figs, almonds and pistachios, as seen in PPNA contexts such as Gilgal (c. 11,400-11,200 BP) and in the Taurus-Zagros arch (Kislev, Hartmann & Bar-Yosef 2006). The plant evidence is varied and complex, with potentially many independent domestication events (Zeder 2011: 45). It seems clear that plant domestication began by the start of the PPNB period c. mid 9th millennium cal. BC and therefore, cultivation must have begun in the proceeding PPNA, as early as the mid to late 11th millennium BC.

3.4(e) ANIMAL HERDING & DOMESTICATION

(i) Overview: issues, methods & identification

The situation for the recognition of early animal herding and domestication is perhaps even more complex. Humans were clearly herding animals (penning them, controlling their movement, access to water and access to food) for a long time prior to the

appearance of archaeologically detectable morphological change signalling the appearance of domestication (Zeder 2011: 45). Like plants, the appearance of animals outside of their natural habitat is a clear indicator of early herding practices: the management of animals by humans, with humans transporting them, and then restricting their movements by use of penning, or some other form of control (Zeder 2011: 46). Changes in kill strategies is the other indicator of the initial stage of animal management (as hunters kill large, meaty animals whist it can be argued that those maintaining a penned, herded stock prefer to keep mainly adult females to reproduce, and a much smaller number of adult males, killing most of the young males for food (Moorey 1992, Flannery 1983, Zeder 2012, Zeder 2011: 47). Therefore a higher than usual (as compared to wild populations) proportion of perinatal animals within a site's faunal assemblage is indicative of herding (Stiner *et al.* 2014: 2-4). Kill strategies however, cannot be used as definitive evidence of herding, especially if considering a small sample size, where it is expected that only a small proportion of the meat animals is represented. Recent work by Stiner *et al.* has demonstrated that in addition, the presence of large quantities of dung on site can be a clear geoarchaeological indicator of ungulate management (2014: 4-5). Also often present at Neolithic sites for use as temper (for mudbricks and mortar) and fuel, the volumes, distribution and "diagnostic variation in character" of certain dung residues attest to their presence as a result of the penning of animals, rather than any other explanation (Stiner *et al.* 2014: 4-5).

(ii) Animal Herding

It is often proposed that the earliest evidence for animal management comes from the Turkish site of Nevalı Çori where sheep management is suggested by the kill patterns of the mid-9th millennium BC phases (Peters, von den Driesch & Helmer 2005, Peters *et al.* 1999). Though this argument is unconvincing, more solid evidence for early herding is seen a few hundred years later (late 9th millennium) at Nevalı Çori, in the fact that goats were likely introduced to the site, which is not located in their natural environmental zone (Peters, von den Driesch & Helmer 2005; Peters *et al.* 1999; Zeder 2011: 46). An earlier appearance of herding can be claimed for Zawi Chemi Shanidar in the Zagros, where fauna is dominated by 60% sheep (Perkins 1964). Non-indigenous, morphologically wild, yet herded sheep are reportedly evidenced at Cafer Höyük, in levels equivalent to the late 9th to mid-8th millennium BC cal. Similarly, morphologically wild sheep are known to have been managed at contemporary periods of Aşıklı Höyük (c. 10,200-9,500 BP cal., Buitenhuis 1997; Zeder 2011: 46) and current research by

Stiner *et al.* (2014) is reinforcing this. Stiner *et al.'s* work has demonstrated very early and definitive evidence of herding by c. 8,200 cal. BC at Aşıklı Höyük, seen in the age-sex distribution of caprine in upper Level 4 onwards (2014: 1, 2-4). This is alongside geoarchaeological analysis of the distribution and composition of caprine dung in the settlement of Level 4 and later (Stiner *et al.*: 4-5).

(iii) Animal Domestication

By the onset of the Ceramic Neolithic, domestication of the four main animal species: goat, sheep, cattle and pig was complete across the entire Near East region. Body size reduction is generally seen as the main indicator of animal domestication; however, this cannot always be clearly and definitively recognised (Helmer 1991, 2008). Zeder therefore, suggests that "there may be no archaeologically detectable morphological change in early managed animals until they were isolated from free living populations and until the opportunity for integration or restocking managed populations with wild ones was eliminated" (Zeder 2011: 46). Definitive evidence of the initial management of animals is elusive in many regions of the Near East, however by 10,500 years ago, all four of the founder livestock species were under human management in different parts of their natural habitat with goats in the eastern Taurus and Zagros mountains, sheep covering Anatolia to the northwest Zagros, cattle in the Middle to Upper Euphrates Valley and pig in the Upper Euphrates and Tigris (Zeder 2011: 47).

Throughout the PPNA and into the EPPNB, wild plants and animals continued as the main subsistence strategy at some sites. It is not until the MPPNB that domesticated plants and animals became the primary means of subsistence, with the earliest, true farming communities being found in the centre of the Fertile Crescent, not reaching the west and eastern parts of the arc until around 1,500-2,000 years after (Zeder 2011: 47). Different strategies are seen across the regions, with people likely adapting to the resources around them, not only in the experiential phases of the Early Neolithic, but continuing into the CN. In a large and complex society subsiding on a diverse range of food stuffs, it does indeed seem plausible that residents would have had the need to count and perhaps record the quantities of supplies obtained, consumed, exchanged and/or stored, yet the means cannot be assumed to be by use of clay objects.

4. 4(f) Alternative Subsistence Strategies

Not all Neolithic communities are farming villages: the economy did not see a simple gradual shift from hunting and gathering to farming in all regions, and as hinted at

above, throughout the Neolithic, a mosaic of economic strategies including farmer-herders, farmer-hunters, specialised hunter-gatherers and fish economies co-existed (Byrd 1991: 105; Goring-Morris 1993: 103; Martin 1999). The southern Levant, particularly the arid zones to the east, and in the Sinai and Negev deserts heralded the beginnings of pastoralism, as early farmers took their domesticated animals with them, abandoning their villages in favour of mobility (Baird *et al.* 1992; Banning, Rahimi & Siggers 1994; Betts 1989; Betts 1988; Goring-Morris 1993; Simmons *et al.* 2001: 2; Simmons 2000: 217).

3.5-SETTLEMENTS:

Characteristics, layout & social structure

INTRODUCTION

Aside from the beginnings of agriculture, the development of fully sedentary communities; villages of permanent houses, occupied year round is the major transformation seen within Neolithic society. Relatively soon after the start of the Neolithic period, people were living in solid houses with growing populations based around villages; a way of life vastly different to that previously experienced. From the onset, Neolithic villages display evidence of pyro-technology, the long distance exchange of raw materials, craft specialisation, storage and eventually methods of marking ownership (Hole 2000: 191). Over the course of the period there is a general consensus of the development of the idea of "household", and an increase in social complexity and household autonomy; with a move from largely communal to household based subsistence, cooking and storage practices (e.g. Byrd 2005a: 260, 266; Byrd 1994: 640, 643, 658). This shift is mirrored by increasing ritual and symbolic practices.

Social Complexity & Social Organisation

The increase in social organisation and complexity during the Neolithic is inferred from housing (size, internal elaboration, standardization and differentiation), site planning and changes in the layout and the presence of corporate buildings. Until the middle of the last century, it was generally assumed that Neolithic societies were simple and egalitarian, but the excavation of sites such as Jericho (Kenyon & Holland 1983, Kenyon & Holland 1982, Kenyon 1981a, Kenyon 1981b, Kenyon 1965, Kenyon 1960, Kenyon 1957) and Çatalhöyük changed this view (Hodder 2014a, Hodder 2014b, Hodder 2013a, Hodder 2013b, Hodder 2010a, Hodder 2007, Hodder 2006, Hodder 2005a, Hodder 2005b, Hodder 2000, Hodder 1996a, Tringham & Stevanovic 2012, Mellaart

1998, Mellaart 1978, Mellaart 1975, Mellaart 1967, Mellaart 1966, Mellaart 1965a, Mellaart 1965b, Mellaart 1964a, Mellaart 1964b, Mellaart 1963, Mellaart 1962). With the onset of sedentism, it is now largely agreed that even seemingly simple, sedentary societies had "at least some minimal level of social complexity" and social organisation in order for them to function (Rosenberg & Redding 2000). Even within the preceding Natufian period, burials hint at the presence of hereditary status expression (idea first championed by G. Wright in the late 1970's and early 1980' in relation to El Wad, Belfer-Cohen 1995: 14. Also see: Byrd & Monahan 1995, Henry 1989, Kuijt 1996, Wright 1978). As new forms of interaction were necessitated by the rise of farming villages, so social complexity increased and elites emerged (Byrd 1991: 63; Hayden 1990; Hodder 1990; Hole 1984; Price & Feinman 1995; Bender 1978).

While it is clear Neolithic society was organised, it is generally assumed that this all took place within the context of an egalitarian society. Indeed people may hold different and specific social roles without the presence of social stratification, each being valued and necessary. Equally, decisions can be made on a group basis, or by a selected group of people assigned to make decisions for the good of the community. It is tempting to see developing societies as hierarchical, and scholars often cite that during the course of the Neolithic, households became more insular and society more stratified. Yet the evidence does not wholly support this, and though society develops and diversifies during the period, its defining concepts and characteristics are apparent from the start. Below is a summary of the defining characteristics of Neolithic settlements and their development.

Trends in Neolithic Settlements

3.5(a) SEDENTISM

It has been claimed that the beginnings of sedentism appear in the Natufian period (Finlayson, Mithen, Najjar *et al.* 2011: 8183) though many scholars now agree true sedentism, living year round, in a permanent structure within an established community (Renfrew 2007: 135, 142-43) is absent that early (Bar-Yosef & Belfer-Cohen 1991, Edwards 1989, Olszewski 1991, Shewan 2004). It is not until the Neolithic period that definitive sedentary sites appear and are found widespread across West Asia (Hayden 1995: 277-78; Verhoeven 2011: 78). Most sites of the PPNA have many metres of stratigraphy, and display an increased investment in, and permanence of architecture, supporting the notion of more sedentary lifestyles compared to the Natufian (Finlayson, Kuijt *et al.* 2011: 126; Finlayson, Mithen, Najjar *et al.* 2011: 8183).

People are living in larger communities consisting of a number of families. Though difficult to reliably estimate and compare, many theorise that related to sedentism, demographic growth is part of the Neolithic "package" (Hayden 1995: 277-78; Peters & Schmidt 2004: 180; Rollefson, Simmons & Kafafi 1992; Simmons *et al.* 2001). Bar-Yosef estimates a 1,600% increase in population density in the southern Levant from the Late Natufian to the PPNB: 4.00 people per km^2 compared to 0.25 people per km^2 in the Natufian (Bar-Yosef in Hayden 1995: 277-78). An example is Jerf Al-Ahmar. Occupied for 500 years at the start of the Neolithic c. mid to late 10^{th} millennium BC, the site is relatively large at one hectare. It contained approximately 30 buildings; all of which were under simultaneous occupation (Willcox & Stordeur 2012: 110).

It is within these new types of communities that humans needed to negotiate relationships with other people well outside of their immediate family or kin group. They needed to work together in order to build settlements, gather resources for subsistence and other needs, and it is likely that in this setting new methods by which to undertake this would have developed. Perhaps clay objects were used in gaming in order to entertain people, who for the first time found themselves in larger groups with people to play within their leisure hours. Gaming could have been a way to bond members of the community. An example of such a potential gaming board is found at 'Ain Ghazal (Simpson 2007: 5-7). Other Neolithic sites with boards include the south Levantine sites of Ghwair I, Beidha and Wadi Faynan 16 (Simpson 2007:5-7. See discussion in section 2.3(b) and figures 2.8 to 2.12, Chapter 2). Alternatively, with larger than ever numbers of people residing together, there certainly would have been many things to count: people, food shares, supplies of raw materials, children, days (between food gathering and seed sewing for example) and the use of these simple clay counters in this context can easily be imagined.

3.5(b) SITE STRUCTURE: LAYOUT & PLANNING

A gradual increase in site size reaches its peak in the PPNB (Hole 2000: 193). Site size is often interpreted as reflecting social complexity, with an assumption that with a larger site and subsequent larger population, there is a need for more complex mechanisms to ensure social cohesion. Likewise, sites with a large population, high density of habitation and those that demonstrate planning in their layout are often championed as demonstrating social stratification and hierarchy. These features may indeed demonstrate social organisation and planning yet this does not necessarily equate to the presence of hierarchical society.

The earliest Neolithic settlements are clearly larger than those of the Natufian. During the PPNA, the average estimated site size varies from 0.1 to 2.5 hectares, with Jericho generally seen as the largest site of the period (Hole 2000; Kuijt 1994). Similarly, the PPNB sees a clear increase in site size from the preceding PPNA and by the PPNC, it is claimed sites reached up to 30 to 40 hectares, with all areas simultaneously occupied, though this is disputed (Gebel 2004: 1-2, 5-6; Rollefson *et al.*1992: 444; Simmons *et al.* 2001: 5). It must be considered that there is in fact little evidence to suggest larger sites were occupied across their total area simultaneously as excavations tend to be focused in a limited area, only 10 or 20% of the entire site area. Furthermore, chronological phases found in only one excavation area may not be present across the entire area of a settlement. Like site size, the demographics of Neolithic settlements are extremely difficult to postulate reliably. Population and settlement density is often inferred from the excavation of only a small percentage of a site, in one or two excavation areas, with the density of structures in one area multiplied by the entire site size, and continuity assumed for the duration of occupation. One example is Netiv Hagdud: this is "large" PPNA site reportedly had up to 200 round structures, interpreted as all being simultaneously occupied, thus suggesting a community of significant size (Bar-Yosef & Belfer-Cohen 1991). Bar-Yosef and Belfer-Cohen (1991), Hole (2000) and Kuijt (1994) all infer that the size of the site, along with its relatively large population alone infer the presence of community leaders, yet there is no evidence, aside from the estimated population size to support this view.

Site layout and density of occupation vary from site to site in the Neolithic. There is no standard village plan, yet the shape and size of domestic architecture is similar across the Neolithic Near East, with many temporal trends followed across the zone. Mostly small areas of housing have been revealed, providing only limited glimpses of village planning. Diversity is seen from settlement to settlement, even across contemporary sites within the same region (Carter, Campbell & Gauld 2003: 122 re. Domuztepe; Düring 2005: fig. 1 p. 11 re. Aşıklı Höyük & fig. 4 p. 17 re. Çatalhöyük). Despite this limited evidence, most Neolithic demonstrate planning, either in town planning or a seemingly organic planning in terms of the location of buildings and roads, yet with houses sharing the same alignment, internal use of space, size, and layout.

3.5(c) DOMESTIC ARCHITECTURE

Over the course of the Neolithic, a general evolution in building plans can be seen in terms of the size and shape of what are widely interpreted as domestic structures (Aurenche 1981; Byrd 2005b: 97; Byrd 2000: 71-89, tbl. 1 p. 72, 91-2; Byrd 1994: 644-56, 658-62; Banning & Byrd 1988; Banning & Byrd 1987; Lechevallier 1977; Moore 1985). The degree of standardization within settlements, and across the Neolithic is certainly indicative of social organisation. Curvilinear buildings appear with the first, temporary/light structures of the Natufian period, continuing into the PPNA in the form of more substantial, permanent dwellings (Byrd 2005b: 97). The majority of the typically PPNA round structures are semi-subterranean, built of stone or mudbrick, including the use of upright slabs and timber supports (Byrd 2005b: 97-98). Hallan Çemi on the Anatolian Tigris for example, an early PPNA site dated to the 10th millennium BC shows clear social organisation in the size, contents and distribution of its houses (Rosenberg & Redding 2000: 48).

Rectangular shaped buildings initially emerge at the end of the PPNA, being characteristic of the PPNB period (though exceptions to the rule do exist). The Middle PPNB phase (phase A) at Beidha exhibits exclusively non-rectangular architecture, and other Early to Late PPNB sites display a mixture of round and rectilinear architecture, especially in the Negev and Sinai, for example 'Ain Abu Nekheileh, Shaqarat M'siad and sites in the Wadi Jilat (Byrd 2005b: 97, Byrd 2000: 74-77). A clear shift from round to rectilinear architecture at the end of the PPNA, or during the transition into the PPNB is documented at many sites, including Jericho, Abu Hureyra, Çayönü, Jerf el Ahmar and Nemrik 9 (Byrd 2005b: 98-99; Kozłowski & Kempisty 1990; Özdoğan & Özdoğan 1989, Stordeur 2000). Some sites of the Northern Levant and central Anatolia, from the PPNB into the ceramic periods show a distinct form of rectilinear structure in the dense clustering of buildings side by side, sometimes divided by narrow alleyways, other times with abutting walls. In these settlements, access into buildings was via the roof, with villages built on terraces, and the roof tops acting as thoroughfares such as 6th millennium BC Tell Sabi Abyad I, Level 6 (see for example: Akkermans & Verhoeven 1995, Duistermaat & Akkermans 1996, Verhoeven 1999), mid 8th to late 7th millennium BC Çatalhöyük East (Cutting 2005, Düring 2007, Düring 2005) and 8th millennium BC Aşıklı Höyük (Düring 2007, Esin *et al.* 1991, Todd 1966).

Rather than reflecting a hierarchical society, the evidence much more likely indicates the presence of organisation within a community. The sites of Bouqras and Abu

Hureyra are located 200m apart, on the banks of the Upper Euphrates, in modern Syria (Hole 2000: 195, 198). Despite their relatively large site size and population, social differentiation is not evidenced at either. There are no corporate or ceremonial buildings for example. All buildings are interpreted as holding single households; they display a similar plan: rectilinear, each with a courtyard area as well as one or two small rooms that were presumably used storage units. There is no evidence of unequal access to goods or an unequal distribution of wealth at the site (Boerma 1989-90; Hole 2000: 195, 196). There are exceptions however, especially if aspects aside from architecture are considered.

Çayönü has clear evidence of differentiation in its PPNB phase (Hole 2000: 199, Özdoğan & Özdoğan 1989). A range of architecture is evidenced in the presence of three notable ritual structures, alongside domestic buildings. The latter show planning in their alignment and placing, less than 5m apart (Hole 2000: 199). They are rectilinear, ranging from 20 to 60m^2 (Hole 2000: 199, fig 1. e, f, k, i p. 197). Housing on the east side of the site within in the "Cell Phase" (c. 9,600-9,200 BP) has revealed a distinct neighbourhood built around an open plaza of 1,000m^2 (Hole 2000: 199). Houses here are up to 60% larger, and better made than their contemporary counter parts in the west (Hole 2000: 200). In plan too they show more elaboration, with a porch like entrance, stone podium skirting and many have paved exteriors (Özdoğan & Özdoğan 1989: 74). Many of the buildings contained "special" artefacts, highly crafted, symbolic items, and items made from imported raw materials; neither of which are seen in other areas of the site (including two life sized stone sculptures of human heads, "chess-pawn-like" stone objects, large obsidian cores and long obsidian blades). In addition, the burials are numerous within this location of Cell Phase, and three in particular are exceptionally rich in grave goods (Hole 2000: 200). All evidence combined points to a much greater affluence in the east of the site, especially within the Cell Phase. This leads to the potential of communal buildings.

3.5(e) COMMUNAL ARCHITECTURE

Commonly termed "Corporate", "Public", "Communal" or "Cult" buildings, buildings where living does not appear to be the primary function are most often interpreted as storage buildings or ritual buildings with a community function (see for example Finlayson, Mithen, Najjar *et al.* 2011: 8186; Rosenberg & Redding 2000: 48). They can be singled out due to their large scale, architectural elaboration, distinct interior fittings and the presence of distinctive objects or burials inside. Some of these structures

appear to have been clearly ritual in function (such as Çayönü's Skull building) whilst for many others, the function is unclear. The designation of "Temple", "Shrine" or "Sanctuary" for some *corporate* or special purpose buildings appears unwarranted at some sites; for example Mellaart's "shrines" at Çatalhöyük (Mellaart, Wheeler 1967: 77-130), the many "temples" of 'Ain Ghazal (Rollefson *et al.* 1992: 450-52, Rollefson 2000: 174-78, 180-81, 181-82, figs. 9, 12, 13), and the "sanctuaries" and "shrines" of Höyücek (Duru & Umurtak 2005: 164-73, 173-177).

Examples of corporate buildings can be found all across West Asia, throughout the Neolithic period, from its inception. Hallan Çemi (PPNA) has two buildings which are significantly different to the rest; with plaster hearths and floors of sand and plaster, which display multiple resurfacing events. Inside these two buildings were benches and the only imported copper-ore found on site, suggesting both had a special, symbolic role (Rosenberg & Redding 2000: 44-45, 48). Another, well-known public building is the tower at PPNA Jericho (Kenyon 1981a: 6, 20, 22-3, 32-3, pls. 5, 7, 9, 19, 26, 212, 236, 244; Kenyon 1957: 51-76). First interpreted as a defensive structure, this piece of architecture is now generally regarded as a ritual and community building (Finlayson, Mithen, Najjar *et al.* 2011: 8186). Special communal buildings and spaces have also been proposed for Jerf el-Ahmar (building EA30, level II, Willcox & Stordeur 2012: 107-09, Stordeur 2000), at Mureybet (Stordeur 2000), Wadi Faynan 16 (building 075, Finlayson, Mithen, Najjar *et al.* 2011: 8183-84) and Beidha (Byrd 1994: 656-57).

An equally early and more extreme example of corporate buildings comes from the site of Göbekli Tepe, southeastern Anatolia. Interpreted by the excavation director as a ritual meeting place for the surrounding, mobile communities; the site has a distinct topographical setting, on top of a mountain 800 miles above sea level (Peters & Schmidt 2004: 182; Schmidt 2000a: 45-46). The earliest date of activity is yet to be verified (but the site may have existed in Palaeolithic times), though the earliest monumental building stage has been dated to c. 9,000 BC (Late PPNA) and other monumental structures to the following PPNB at c. 8,000BC (Peters & Schmidt 2004: 184; Schmidt 2000: 49). Peters and Schmidt claim all occupational levels at Göbekli Tepe lack hearths, fireplaces and the "other usual traces of domestic life" (Schmidt 2000a: 46-49; Peters & Schmidt 2004: 215) though evidence of a domestic settlement is hinted at in the presence of faunal remains at the site, which are typical of the PPNA (dominated by a hunted species with auroch and gazelle forming the bulk of meat consumption) (Schmidt 2000: 47; Peters & Schmidt 2004: 207-08, tbl. 1).

The scale of architecture at Göbekli Tepe is remarkable. There is not only on corporate building, but many monumental structures. Monoliths inside the PPNA buildings stand up to 3.5m tall adorned with animals carved in relief (figure 3.3). The later PPNB structures include pillars of 1.5m tall, displaying sculptures in raised relief, and smaller free standing sculptures (Peters & Schmidt 2004: 182-83, figs 15, 22, 24; Schmidt 2000a). Göbekli's pillars have detailed depictions of various species of wild animals in relief, including fox, snakes, wild boar, wild ass, wild sheep, leopard/lion, brown bear, gazelle, cranes, ducks, scorpions and various other birds, insects and reptiles (Peters & Schmidt 2004: 183-184, 206, figs 7-17, tbl. 2; Schmidt 2000a: 49-51, figs. 3-4). The later (PPNB) pillars at Göbekli Tepe are very similar in style to those from the nearby PPNB site of Nevalı Çori (figure 3.4, Hauptman 1990: fig. 1). The manpower and skill of craft required in their creation point to the work of a large number of people, suggesting a high scale of social organisation, the division of labour, and craft specialisation. Thus the community implied by this, far from being the work of small, mobile hunting bands, is a large, sedentary, hierarchical society. The large open spaces within Göbekli's "ritual" structures could have been the location of performance, as evidenced in the Neolithic in other spheres (Peters & Schmidt 2004: 208-14, 215).

Many more examples of large scale, special purpose buildings can be cited, from the 8th into the 6th millennium BC, such as the tripartite buildings at PPNB Yiftahel, southern Levant (Garfinkel 1987: 202-09), the large monumental complex including "Ritual Building T" and associated courts at 8th millennium BC Aşıklı Höyük (Esin *et al.* 1991: 126, 128, 131), and the mid-late 7th millennium BC "Shrines" at Höyücek, Anatolian Lake District (Duru & Umurtak 2005: 164-73). Yet is the existence of such buildings evidence of social stratification and hierarchy, or merely a socially complex, specialised, highly organised yet egalitarian society? The terms "public" or "corporate" building to describe these structures is misleading, as there is little evidence to suggest they were public at all. The large size of some examples is not evidence of open access. Size can be used to display status, wealth and power, yet as seem in archaeological and ethnographic examples from many world regions large residential, economic and religious units and institutions (such as the palace or temple) most often have restricted access, despite their huge size and lavish architectural elaboration.

Rosenberg and Redding (2000: 48-9) and Byrd (1994) suggest the presence of corporate buildings demonstrates clear social organisation from the onset of the

Neolithic period, interpreting the buildings as formal socio-political structures utilised to facilitate conflict resolution, and for group level decision making in order to promote group cohesion. Another possibility is the use of these spaces as communal performance spaces. People may have gathered within these large arenas to hear announcements, and watch or participate in dances, songs and other performances. Again access to these displays may have been restricted; however it is likely this kind of activity would have been more accessible to all.

3.6-STORAGE

3.6(a) IMPORTANCE OF THE TOPIC

The introduction of storage systems is often interpreted as an important social and economic step in the process of the Neolithisation of the Near East. The onset of sedentism and increasing plant cultivation and domestication are often assumed to directly correlate to the appearance and increased use of storage in the Neolithic (Kuijt 2011: 137-38). Yet the study of food storage systems is often underrepresented in Neolithic research, despite the crucial importance with the advent of agriculture.

Relevance to clay objects

In many societies, wide scale food storage pre-dates domestication and sedentism (Cho & Ko 2009: 149; Kaner 2009: 123; Pesonen & Leskinen 2009: 299; Zhushchikhovskaya 2009: 121-24). This is also hinted at in some regions of the Near East, with food storage evidenced in the southern Levant during the Natufian, and by the pre-agricultural communities of the PPNA (i.e. at Wadi Faynan 16 and Drah'. Finlayson, Kuijt *et al.* 2011: 129-30; Finlayson, Mithen, Najjar *et al.* 2011: 8182-8186; Kuijt 2011: 138). The existence of food storage does not signal the presence of a sedentary or an agricultural community, nor does storage mean a surplus of food was present, yet it is often claimed that food storage is very much related to economic decision making, and social developments characteristic of the Neolithic period; namely community organisation, manipulation and the emergence of social differentiation. Therefore, the control and storage of food has been claimed to be the "critical foundation for the emergence of social differentiation" (Bender 1978; Hayden 1990; Kuijt 2011: 138). This interpretation is contentious, especially considering the issues raised above. People may be subject to manipulation by means other than food. Also, there is no evidence in the Neolithic Near East at least, for a correlation between social differentiation, social stratification and food abundance. If wide scale food storage is practised in egalitarian, pre-agricultural, mobile communities; then why for the Neolithic in West Asia, should it

suddenly become an indicator of social stratification and social organisation? Furthermore, storage does not only relate to food stuffs. In the Neolithic, a number of artistic craft items were being produced on site, stored as finished products and the raw materials needed to make them traded unfinished too. Therefore storage may include such materials, in addition to food stuffs.

The development of storage is directly relevant to the topic of "tokens". With the proliferation of storage facilities, the increase in scale of storage as well as the ever increasing range of goods, products and commodities being stored, the needs of Neolithic people to count out and keep track of the storage and circulation of these items needs to be considered. This may have been, at the most simple form (individual or household level) done in order to count and maintain one's personal supplies. At the other end of the spectrum, geometric clay objects could have been used in a regulated, site-wide, or even inter-site system. This can be imagined if the presence of storage is taken as signalling the presence of a food surplus, and the theory that a surplus led to the accumulation of influence, control and wealth by a few within society. If this situation did occur, it is likely that the resulting influential individuals or groups would need to keep track of the amount of surplus they amassed, in order to maintain supplies, and thus retain control.

Storage Visibility & Interpretation

Reconstructing food storage practices poses many methodological challenges. The mere presence of vessels does not necessarily indicate food storage. Indeed the world's earliest pottery vessels, found in Japan, were never used for storage, only for cooking (Kaner 2009: 98, 104-05). At many Neolithic sites of the Near East, evidence for food storage is poor. The materials used for portable storage containers, commonly organic (baskets and bags), do not survive well. Furthermore, unless found with abundant plant remains *in situ*, the interpretation of free standing buildings, annexes, silos or other so-called *storage* features is subjective (Kuijt 2011: 139). Substantial, built, non-portable containers, storerooms and storage units are relatively common in the archaeological record of the Neolithic. However, it is likely that smaller, portable containers were more commonly used to transport and store agricultural produce. Though bags and pouches of leather, linen and other organic materials rarely survive, their presence on Neolithic sites is suggested indirectly evidence. Similarly, baskets would have been ideal receptacles for agricultural produce being strong, durable, lightweight and stackable. It is likely such organic containers were extremely commonplace in the fields

and villages of the Neolithic Near East, perhaps even more so than the more archaeological visible built storage structures, as indicated by the strong evidence of basketry from Boncuklu Höyük, Çatalhöyük and other sites (see below, and Chapters 4.1-4.2).

3.6(b) CHRONOLOGICAL OVERVIEW OF NEOLITHIC STORAGE

From the beginnings of sedentism, in the Natufian period and throughout the Neolithic, evidence of storage is found in the archaeological record. In general there is a trend which sees storage evolve from small and portable, to larger, immovable receptacles. There is a corresponding move of storage location from communal, external, open spaces into the interior, private space. This implies concepts of private ownership, household, or even individual autonomy emerging in the Neolithic. Most early storage comes in the form of basketry, stone bowls, wooden bowls and containers (Garfinkel & Epstein 1999: 8-12). Into the PPNB period, storage diversifies, with the introduction of whiteware or plaster vessels, large immovable unbaked clay containers and purpose built storage annexes; sometimes entire levels within buildings (Garfinkel & Epstein 1999: 8-12, Banning 1998, Garfinkel & Ben-Shlomo 2002: 74).

The start of the Pottery Neolithic marks the onset of a major development: pottery, but its impact may not have been as dramatic as first imagined. Before this time, people in the Near East were successfully storing goods in other ways despite the abundance of clay. Indeed, large scale storage utilising pottery vessels does not appear to have been undertaken in the Neolithic. Instead, built storage buildings (such as those typical of the Halaf period in the 6th millennium BC, but also found much earlier), annexes (i.e. such as the internal storerooms inside buildings from Çatalhöyük East) and the specifically designed basements or sub-floor building levels in the southern Levant (the MPPNB and LPPNB "Pier Houses") were used. These facilities increased in frequency and distribution over the course of the Neolithic (Banning & Byrd 1988).

Pre-Pottery Neolithic Storage

Evidence for early basketry is mostly of an indirect nature, in the form of impressions in clay, and the presence of reed plants in abundance at sites (i.e. at Boncuklu Höyük). Basketry appears to have been a common storage and transportation tool from at least the start of the Neolithic, with some types being waterproofed to improve their functionality (Garfinkel & Epstein 1999: 8). The earliest example comes from PPNA Gilgal, South Levant, where a basket coated in bitumen has been recovered (Noy 1989:

13). The use of basketry continues into the PPNB and the Ceramic Neolithic Period where their use is heavily attested at sites such as Tell Sabi Abyad and Çatalhöyük (Akkermans & Verhoeven 1995: 12, 22; Atalay & Hastorf 2006: 299). Though the number of examples is low, the evidence recovered hints at a much more extensive use of basketry across the entire region. Stone bowls are also very common, across the entire Near East, present in substantial quantities at sites such as Jericho, Basta and Abu Ghosh. These durable, small open vessels however are far less likely to have been used for food storage. They more likely functioned in the preparation and serving of food stuffs (Garfinkel & Epstein 1999: 8).

The use of basketry for storage is often imaged as only providing a small scale of capacity, however, it is possible to craft relatively large (over 1m tall and 0.5m in width), amphora-shaped basketry containers, and a room full of such basketry vessels has the capacity to hold huge quantities of grain and other stored food-stuffs (figure 3.9). More direct evidence of large scale food storage in the earliest Neolithic phases is attested at Netiv Hagdud, South Levant and at Jerf el-Ahmar on the Upper Euphrates. Both are permanent, sedentary PPNA sites, with evidence for the cultivation of wild plants, and the hunting of wild animals as the main subsistence strategy; however both also display the storage of hundreds of wild lentils. Though the storage containers have not survived, baskets seem the most likely organic container to have been utilised. The lentils would have needed to have been transported from fields to site, and again lightweight, durable baskets would have been ideal for this task (Zeder 2011: 44). Likewise, excavations at PPNA Dhra' (South Levant) have revealed well-constructed, purpose built granaries, capable of large scale food storage (Kuijt & Finlayson 2009: 10966-10969, figs. 4-5).

The PPNB period sees an increase in the variability of storage facilities, mirrored by changes in residential architecture (Kuijt 2011: 140-44; Garfinkel & Epstein 1999: 8; Garfinkel & Ben-Shlomo 2002: 72-76). Yet evidence of the continued use of basketry (mostly indirect) continues. Stone bowls also remain a feature of most PPNB sites (Garfinkel & Epstein 1999: 8). The PPNB cave site of Nahal Hemar (South Levant) has clear evidence of basketry, with many examples showing thick bitumen waterproofing (Bar-Yosef & Alon 1988). Wooden bowls are also attested at a small number of PPNB sites, though their use in storage is not certain (see also later examples from Çatalhöyük East, level VI: Mellaart 1967: pls 105-108). In addition, plaster vessels, are used across the Levant being found in huge numbers at southern sites such as 'Ain

Ghazal in the 7th millennium BC, with many more examples uncovered from sites in the North Levant from the early 6th millennium BC (i.e. Tell Sabi Abyad, Tell Ramad stratum II, Ugarit stratum Va and Tell el-Kowm). A small number of PPNB sites also contain large, rounded containers of baked clay (Garfinkel & Epstein 1999: 13). These probable silos are large and non-portable, and are evidenced at Çayönü (small and large, unbaked clay containers: Özdoğan & Özdoğan 1993: 93), 'Ain Ghazal (Rollefson, Simmons & Kafafi 1992: fig. 13) and Basta (Nissen *et al.* 1987: pl. V: 3). Similarly, Beidha and Ganj Dareh Tepe exhibit smaller containers, made from baked clay, yet before the advent of pottery as such (Kirkbride 1966a: fig. 4. 4; Crépeau & Smith 1983). In addition, residential structures in the MPPNB see the appearance of in-built storage facilities (see figures 3.6 and 3.7). In central Anatolia, silos or storage boxes, constructed of clay slabs are common (figure 3.5), attached to one another to form large, immovable storage facilities, which were placed both inside buildings, and in the open spaces between them (figure 3.5, also see discussion in Chapter 9 and figure 9.41).

By the mid-8th millennium BC (end of the middle-start of the LPPNB), the nature of storage had changed, with access becoming more restricted. At this time a clear shift in the location of storage is apparent and widespread (e.g. at Beidha and Ghwair I: figures 3.7 and 3.8.). No longer are storage containers portable, nor facilities of a great storage capacity such as those seen at PPNA Wadi Faynan 16 and Dhra', located in communal areas of the village. Instead there is a shift from communal to private storage (Kuijt 2011: 140) indicating the concept of individual ownership is observed (seen at 'Ain Ghazal, Basta, Jericho, Beisamoun, Yiftahel, Es-Sifiya, Ba'ja. Çayönü, Nevalı Çori and Yarim Tepe and Hacilar level IIA/B . Banning 1998: 65-9. Fig. 2 p. 67; Garfinkel & Ben-Shlomo 2002: 73-4; Hole 2000: fig. 1 p. 197; Kuijt 2011: 140-142; Mahasneh 1997; Mellaart 1970a: 25; Mellaart 1970b: fig. 25). This trend is exemplified by Bouqras on the Upper Euphrates. In the PPNB, every single domestic unit within the large site (estimated 850 residents) contains built-in storage units, clearly showing that every household had its own ability to store goods, and had private control over what was stored (Hole 2000: 195-6. Fig. 1. i, j).

Ceramic Neolithic Period

Pottery is not introduced to the Neolithic Near East until towards the end of the sequence, long after the need and technological skill was present. Pottery is not systematically widespread until around 3,000 years into the period. At this time, c. 7,000 cal. BC, pottery appears simultaneously across Upper Mesopotamia, southeast

and central Anatolia and (Nieuwenhuyse, Akkermans & van der Plicht 2010: 72). At this time, fully sedentary, mixed farming villages covered the zone, and had done for hundreds of years. The earliest sites in the Near East to evidence widespread pottery are Tell Sabi Abyad (figure 3.9), Tell Halula, Akarçay, Mezraa Teleilat, Seker al-Aheimar and Salat Cami Yanı (Nieuwenhuyse, Akkermans & van der Plicht 2010: 72). In the southern Levant, the earliest pottery is not found until c. 5,750 BC, at the Yarmukian sites of the Jordan Valley (Garfinkel & Miller 2002b: 1, 4; Gopher & Gophna 1993: 306; Kuijt 2000b: 6; Rollefson, Simmons & Kafafi 1992: 447). The timing of the introduction of pottery in the Near East in comparison to it's cultural and economic developments is incongruous, especially compared to many other regions in the world, such as Japan, Korea and the Russian Far East where the world's first pottery, used to boil food appears very early, in pre-Neolithic, hunter-gatherer contexts (Cho & Ko 2009: 149-52; Kaner 2009: 96; Nieuwenhuyse, Akkermans & van der Plicht 2010: 73; Zhushchikhovskaya 2009: 121-26).

IMPACT OF POTTERY

The earliest ceramics in the Near East had little impact on storage practices. They were individually produced, on a small scale, and their decorative nature, fine quality and limited number shows they were certainly not used for storage. The early, fine mineral ceramics may have been used for cooking and some examples from Sabi Abyad show traces of soot, however the small number of ceramic vessels in circulation at each site, and the small number of sites evidencing them suggests the impact of their presence to be negligible at this time. There is no evidence to support the notion that the introduction of pottery (both the incipient phase and the widespread, large scale distribution) prompted any significant cultural change in the region (Nieuwenhuyse, Akkermans & van der Plicht 2010: 83).

3.6(c) CERAMIC NEOLITHIC STORAGE TRENDS

The Ceramic Neolithic, with the introduction of pottery, heralds a new sub-phase, though traditional storage systems continue. Many of the painted "Halaf" wares display intricate geometric designs which appear to replicate basketry, suggesting a co-use of these two container forms (figure 3.9). The Central Anatolian site of Çatalhöyük East has an abundance of direct and indirect evidence of storage within the private domestic space (Atalay & Hastorf 2006; Demirergi *et al.* 2014). The 7th millennium BC evidences storage in the form of hanging bundles, baskets, wooden boxes and basins. This is in addition to, storage bins and internal larders (small storage annexes accessed by a

small doorway or crawl space), which are identified in almost every excavated building at Çatalhöyük (Atalay & Hastorf 2006: 299-302; Cessford 2007: storage bins fig. 11. 1 p. 361, fig. 11. 12 p. 370 & fig. 11. 14 p. 372; Cutting 2005: see fig. 10. 2 p. 153 for storage bins; Garfinkel & Epstein 1999: 8; Matthews 1995: see fig. 9. 1 p. 129 & fig. 9. 6 p. 139 for storage bins; Mellaart 1967: plates 105-08; Mellaart 1964a: figs. 35-9; Mellaart 1963: fig. 3; Wendrich 2005). No significant change in storage practices is seen between the pre-ceramic and the ceramic levels at Çatalhöyük, suggesting the introduction of ceramics had little impact on them.

The use of clay objects to count, and record the quantity and range of the varied stored goods (as seen in Sumer from the 4th millennium BC, and promoted by Schmandt-Besserat 1996, 1992a) would surely have been useful. Furthermore, the use of sealings and stamp seals could have been used to mark ownership and prevent the unauthorised opening of privately stored goods (see Chapter 5: Methodology for full introduction to the use of sealings). The function of the earliest (late 7th to early 6th millennium cal. BC) stamp seals is not as clear as Schmandt-Besserat (1996, 1992a) claims (see e.g. Denham 2013: 35-54; Wengrow 2008). In addition to their role of stamping their impression onto wet clay, sealing a container, Neolithic stamp seals appear to have been markers of personal, household or group identity (in a similar way to the interpretation of incised stones and grooved stones of the Neolithic such as those common at Boncuklu Höyük, see Chapter 4. 1) (Wengrow 2008: 7, 14). Likely worn on the body (as evidenced by the suspension hole present on almost all Neolithic stamp seals, see figure 3.10), the wearer may have displayed authority, prestige and influence, via conspicuous seal ownership. The size, shape, colour and/or raw material of a seal may also have been used for this purpose. In addition, the design on the stamp seal would have been transmitted onto the sealing of sealed commodities when used, acting as personal branding perhaps (though not immediately visible to others when being worn) (Denham 2013: 248-250, Wengrow 2008: 7, 14). Likewise, stamp seals may have had an additional function as amulets; imbued with magical properties, they may have protected the wearer, as well as the items sealed by them (Denham 2013: 35-54, Wengrow 2008: 7, 14). Again, the colour, raw material and iconography of a seal likely influenced this.

No clear evidence of the use of sealings is seen at Çatalhöyük; however Halaf sites in the Upper Euphrates and North Levant of the 6th millennium BC contain an abundance of storage evidence in the form of clay sealings. The sealings display contours of the

container they closed, often along with stamp seal impressions supporting the interpretation they acted as stoppers to close and mark a portable container. An excellent example of this practice comes from level 6 of operation I at Tell Sabi Abyad. Here, at least five different types of container (basketry, pottery, stone vessels, leather bags and plaited mats) are evidenced by reference to the reverse side of the sealings, and at least eighteen methods of sealing can be discerned (Duistermaat & Akkermans 1996: 19-22, tbl. 1 p. 20, tbl. 3 p. 21; Duistermaat 1996: 342-351). These figures are a conservative estimate as the limited extent (in comparison to other excavations of recent decades) to which sieving and flotation was employed at Tell Sabi Abyad means that a large sample size, and more diverse range of cultural materials may have in fact have been excavated from the site's buildings and open spaces.

Sealings are a characteristic feature of Halaf period sites, as is the architecture, which combines rectilinear and circular buildings of varied sizes within a single settlement. Often, small (1.5m diameter or less) independent tholoi are interpreted as storage structures. Likewise, some of the larger rectilinear buildings are subdivided into small (1.00m^2 units), thus receiving the same interpretative function (as exemplified by buildings I and II, level 6 Tell Sabi Abyad I, Akkermans & Verhoeven 1995: 9-19, fig. 2 p. 8, fig. 3 p. 9, fig 4 p. 10; also buildings at Umm Dabaghiyah, Kirkbride 1978: 4-5, plan 1; and at Yarim Tepe I, Merpet & Munchaev 1987: 98, pl. XXXVII). It is clear that even in the later phases of the Neolithic period, regional and site specific practices continued.

3.6(e) DISCUSSION

A gradual increase in storage capacity is seen over the course of the Neolithic. There is also a general trend to the increasing privatisation of storage, with facilities moving into the domestic sphere, or having controlled access in the form of sealings. If small geometric clay objects were used in the counting of agricultural goods, surely there would be a clear, increase in their frequency and density at sites corresponding to the increased storage capacity, and autonomous nature of storage? Each household, if possessing its own storage facilities should in theory have its own set of clay objects with which to count its stored foodstuffs, possibly archived in order to act as a log of quantities or units stored. Different "types" of clay objects could also be expected to be found at sites where multiple food stuffs were being stored within a single household; that is *if* clay objects were being used to record information specific to the nature, not only the number of items stored.

3.7-CRAFT SPECIALISATION & EXCHANGE

OVERVIEW

The emergence of village communities necessitated specialism and the division of labour. Farming was much more time consuming than hunting and foraging, and therefore the assignment of tasks, especially particularly laborious ones would have been necessary for the efficient running of society. The transformation was gradual, yet from the 11th millennium cal. BC in the northern Fertile Crescent, semi-sedentary communities appear, which by the following millennia, exhibit planned settlements with the division of space, including specialised workshop areas, seen at sites such as Mureybet, Nevalı Çori, Cheikh Hassan, Cayönü Tepesi, Jerf el-Ahmar and Dja'de (Peters & Schmidt 2004: 180). The internal sub-division of space inside PPNB buildings further attests to the increasing specialisation of labour and crafts. Extensive long distance trade networks had been operating in West Asia from at least the Natufian period; with items such as marine shells found hundreds of kilometres from their origin (figure 3.11) (Byrd & Monahan 1995: 261, 269, 272, tbls 4, 6; Hayden 2004: 267-68). However, these networks intensified and diversified in the Neolithic, with items including shells, timber, stone, pigments and obsidian acquired from long distances; often as raw products, yet sometimes as finished goods such as tools, beads and pottery, especially in the later Neolithic phases (figure 3.12).

The hallmarks of the Neolithic period, namely farming and sedentary life, required skilled crafts in order to produce the tools necessary for harvesting, cereal processing and to produce lime plaster (used to line the walls and floors of domestic buildings, also storage facilities thus eradicating damp and pests). Bone needles and awls attest to the making of matting, baskets and clothing, whilst flint and obsidian scrapers are evidence of the processing of animal skins for fur and hides. Ornamental and symbolic objects were also produced, and even simple items for daily use were sometimes elaborately decorated requiring a greater investment of time, and degree of skill than was necessary to produce the artefact.

DISCUSSION

Related to exchange is the question of seals and sealings. In the Halaf of the 6th millennium BC, seals and sealings often appear alongside clay objects, and are generally accepted as emerging in the late Halaf to meet the requirements of new economic developments (Schmandt-Besserat 1996: 1). However as seen above, from the early Neolithic, craft specialisation, the storage of agricultural goods and long distance

exchange were all in operation. Clay objects appear in the 10th millennium BC, becoming widespread from the 9th millennium, thus the later widespread appearance of seals could be interpreted as indicating the earliest use of clay objects to be of a different nature, one outside of the administration sphere (they may have been used to count other types of things, or in gaming, divination or ritual for example). Yet clay objects may have been utilised in the administration of early agricultural and other goods, in a simple way independent from seals. Indeed, when considering the types of economic activities evident from the Early to the Late Neolithic, the need to administer these in some form appears to be present from the onset.

Though rare, the earliest known stamp seal impressions (which are on plaster) date to the late 7th millennium BC (uncalibrated) and come from the sites of Tell Bouqras and Tell el Kowm, both in modern-day Syria (Duistermaat 1996: 342; Duistermaat & Akkermans 1996: 18-19). Likewise, stamp seals themselves have a small but regular occurrence in Upper Mesopotamia from the same date, yet the earliest known sealings in clay date to the end of the Halaf period, found only in very modest numbers and at a handful of sites (the large 20 hectare site of Domuztepe on the north west edge of the Halaf region has uncovered 29 seals and 1 sealing, all dating to the early 5th millennium BC (Campbell *et al.* 1999: 413-14). Tepe Gawra has as total of three clay sealings and a few stone stamp seals (Tobler 1950: 176). Whilst Tell Arpachiyah has 13 sealings (two of which are possibly not sealings) and 27 burnt clay sealings, again mostly found in a burnt deposit (TT6 Burnt House) dating to 5,300 cal. BC (Campbell 2000b: 1, 2, 12-13, 17, 32-34). Khirbet Derak has 40 (Duistermaat 1996: 342; Duistermaat & Akkermans 1996: 18-19).

3.8-SYMBOLIC REVOLUTION:

Belief, Ritual & Symbolism

OVERVIEW

Evidence from the ritual and symbolic sphere shows undeniably, that the Neolithic Near East sees the convergence of new behaviours, clearly prompted by the change in life ways. This is evidenced in mortuary practices, ritual action and material culture in the form of portable objects, architectural elaboration in installations, paintings, and large scale sculpture. Symbolism is expressed in the Neolithic through various means. Abstract geometric designs are common across many media, but equally common is the naturalistic rendering of humans and animals, which is important in the context the period, a time when the boundaries between humans and nature were being redefined

(Hodder 2011: 112, Cauvin 2000, Cauvin 1994). Cauvin in particular stresses the appearance of the Goddess and the Bull (the bull as an anthropomorphic god) in the PPNA, as the first human divinities in the Near East (1994, 2000). There is an increasing consensus as to the importance of belief, ritual and "religion" in the emergence of civilisation as we know it today as commencing during the Neolithic period (Hodder & Meskell 2010; Horwitz & Goring-Morris 2004: 166, 176).

It is no co-incidence that at the time of the emergence of sedentary communities, increased and intensive plant cultivation and the domestication of animals, that an explosion in symbolic, ritual behaviour, as expressed in varied aspects of Neolithic culture is seen at all sites and across the entire region (Belfer-Cohen & Goring-Morris 2011; Kuijt & Goring-Morris 2002; Kuijt 2000c: 106; Hodder & Meskell 2011; Hodder & Meskell 2010; Horwitz & Goring-Morris 2004: 166; Verhoeven 2011: 81-82; Verhoeven 2000; Bar-Yosef & Belfer-Cohen 1989a; Bar-Yosef & Belfer-Cohen 1989b). Strong ritual evidence is seen in the north at the start of the Neolithic, at sites such as Göbekli Tepe (see below), Körtik Tepe, Jerf el-Ahmar and Tell 'Abr 3 (Belfer-Cohen & Goring-Morris 2011: 93). Comparable evidence is found in the PPNA of the southern Levant, as seen in the symbolic behaviour found at sites including Jericho (the monumental tower and associated burials) Netiv Hagdud (seen most clearly in the large number of decorated stones and figurines) (Gopher 1997, Bar-Yosef & Gopher 1997) and at WF16; as seen for example, in the geometric designs in the walls of public building 075 (Belfer-Cohen & Goring-Morris 2011; Finlayson, Kuijt *et al.* 2011: fig. 4; Kornienko 2009).

Ritual is most commonly defined as a "set of fixed actions and sometimes words performed regularly, especially as part of a ceremony" (CDO 2014); simply put, *repetitive, symbolic action*. The meaning of ritual within society can interpreted in a multitude of ways. Influenced by Emile Durkheim's (1915[1912]) seminal work, ritual activity it has been argued, may be explained as the way by which people define and explain social relationships (Kuijt 2000a: 137); acting as a way to maintain egalitarian social systems and to cement community identity (Berreman 1981; Bohem 1993, Flanagan 1989; Rollefson 1998: 57). Speaking specifically of the function and meaning of ritual in the Neolithic Near East, Kuijt (1996, 2000a) believes ritual behaviour, as manifest most clearly in mortuary practices, formed an important part of the lives of early farming communities. He feels Neolithic ritual reflects a society fearing social differentiation, and was therefore used by community leaders as "a powerful means of social integration" (Kuijt 1996: 313). Kuijt believes the transition from a mobile to

sedentary lifestyle was difficult, and thus burial practices were used to mask and idealize day to day difficulties (Kuijt 1996: 315). Even by the PPNB, Kuijt feels communities continued to adhere to strict codes defining mortuary practice, and used ritual as a way of "symbolically and physically linking and defining individuals" (Kuijt 2000a: 139), as well as a method to "reinforce a shared community ethos and limit the development of social inequality" (Kuijt 1996: 332).

To the contrary, others have understood ritual as a route by which to elevate ones status (Hayden 1995, Fried 1967, Fried 1960). For example, Verhoeven (2002), in his examination of Neolithic ritual in the Levant and southeast Anatolia (PPNB) divides ritual into "individual", "household" and "public" spheres (2002: 253). By definition, the first two spheres would not necessary have served to unite the community or functioned to defuse any tensions associated with Neolithic village life. Verhoeven does associate "public" ritual with concepts of communality. However although ritual events are often related to the (so-called) "communal" buildings of Neolithic sites, misleadingly, "public" ritual most likely did not involve the entire community, with participation being restricted to select members of society (Verhoeven 2002: 253-54, fig. 11 p. 253).

Ritual behaviour comes in many forms; the most evocative is found within the mortuary sphere It would be unwise to suggest clay objects were utilised in ritual practice at a site that has no visible evidence of ritual, however ritual comes in many forms. Some acts such as ritual singing and dance are invisible archaeologically, however elements of them such as musical instruments and costumes for example, as well as representations of the rituals being enacted may survive. Evidence from the Neolithic suggests ritual was part of everyday life, with evidence of ritual activity found in many spheres.

3.8(a) Ritual Evidence

Human remains are underrepresented at most Neolithic sites, when compared to site size, population estimations and occupation length. This suggests the evidence recovered represents the treatment of only a select component of the community. Mortuary practices within the Neolithic are distinct, yet diverse. Primary burials occur in various locations, and in a multitude of forms within any single region or phase. Both single and multiple burials exist. Burials are placed in a variety of locations. They can be found in open spaces within sites; such as the "trash" burials placed in midden-like

areas at PPNB 'Ain Ghazal (Rollefson, Simmons & Kafafi 1992: 461, 463; Rollefson 2000: 169). Burials also occur under the floors of internal spaces and enclosed courtyards of domestic structures, as seen at sites throughout the Neolithic including Çatalhöyük (Hodder 2006: 207), 'Ain Ghazal (Rollefson, Simmons & Kafafi 1992: 461, 463; Rollefson 2000: 169), Abu Ghosh (Sklar-Parnes & Smith 2003), Abu Hureyra (Moore, Hillman & Legge 2000) and Ghwair I (Simmons & Najjar 2006).

Many of these primary, articulated burials are headless. Aside from primary burials, the practice of post mortem skull removal and re-deposition (either singly, or most often in caches-figure 3.13a) is seen commonly in the Neolithic, at sites including Jericho, 'Ain Ghazal, Çatalhöyük, Abu Hureyra and Nahal Hemar (Kuijt 2000a: 149-50, 152, 154-56, tbls6. 1, 6. 2, fig. 5; Kuijt 1996; Rollefson 1983: pl. IV no. 1; Rollefson 1998: 44; Le Dosseur 2010: 2; Kenyon 1981a: pls 33b, 36a-b, 48b, 59a, 63a). From the mid 9th millennium (PPNB), there is an increased appearance of human skulls, found separate from their bodies. These are re-modelled with plaster, the eyes commonly decorated with shells and bitumen. Red-ochre is sometimes applied as pigment (figure 3.13b) (Butler 1989; Maleson, Comerford & Moore 1992; Rollefson 1983: 35; Kuijt 1996: table 4 p. 329; Kenyon 1981a: pls. 50b. 51a-b, 52a-b, 53a-c, 54a-d to 57a-d, 58a-b, 59b-c). These re-modelled skulls are found buried within settlements. Yet separated from their bodies, they show wear, suggesting they were circulated and utilised in ritual before being re-interred (Bonogofsky 2005: 126-30, figs 2 & 3 pp. 126-127; Kenyon 1981a: i.e. pls 36 & 155; Kuijt 1996: 319, 322, 327-28, tbl 1 p. 320; Rollefson 1983: 35); such as those cached in the Skull Building at Çayönü (Hole 2000: 200; Schirmer 1990: 378-382).

The site of Kfar HaHoresh, occupied from the mid 9th to mid 8th millennium BC, exemplifies the range of mortuary practices evidenced during the Neolithic, and particularly the interplay between symbolism, animals and humans within the mortuary record. The highly symbolic evidence, along with the apparent "paucity of residential architecture" has led to the categorisation of the site as a "ritual" or "cemetery" site by the excavators, acting as a special mortuary cult centre for residents of the neighbouring villages such as Abu Ghosh, Beisamoun, Munhata and 'Ain Ghazal (Goring-Morris 2000: 109; Horwitz & Goring-Morris 2004: 165-66, 169). Over sixty individuals are estimated to be interred in primary and secondary burials at Kfar HaHoresh (Horwitz & Goring-Morris 2004: 167). There is a great deal of evidence for the manipulation of human bones; fifteen of the primary burials display typical PPNB

post deposition skull removal and in many instances, human bones have been retrieved from graves, to be arranged in special alignments on the top of ground (Goring-Morris 2000: 109; Horwitz & Goring-Morris 2004: 166, 169 , figs 3, 4a & 4b). Despite the debates around the interpretation of the site, and the evidence from it, Kfar HaHoresh clearly highlights the multitude of mortuary rituals undertaken, within just one site in the Neolithic.

The frequent occurrence of cattle in Neolithic imagery (both on wall paintings and portable artefacts) is often cited as evidence in support of the animals holding a special place within Neolithic society; and even the existence of a "cattle cult" (as initially proposed by Cauvin 2000, 1994). Indeed, there are many examples of the ritual use of cattle (either their physical remains or representation of them). 'Ain Ghazal is just one example. The site has yielded a large number of zoomorphic clay figurines, many of which represent cattle. Evidence of their use in ritual is clear with the "killed cattle" examples (impaled clay cattle figurines created with flint knives through the torso), along with a "slashed bull" and butchered calf present in the figurine assemblage (Rollefson 2010; Rollefson 2000: 167; Rollefson, Simmons & Kafafi 1992: 464-66).

Ritual mortuary practice evolves throughout the Neolithic. In general, Halaf sites have little evidence of mortuary practice though there are exceptions. Extending over twenty hectares Domuztepe is the largest known Halaf settlement. It evidences high levels of ritual activity, likely aimed at community bonding, to prevent fissioning within the community. Most notably, the deposit known as the "Death Pit" poses interesting questions related to mortuary rites, and alternative ritual practice. Both the human and animal (primarily sheep/goat, pig, cattle, and dog) bones are found within the deposit. All are highly fragmented, with similar cut and chop marks on all species (Kansa, Gauld, Campbell & Carter 2009: tbls 1a-c). Many interpretations relating to the nature of the deposit have been offered by the excavation team and other scholars. These range from ritual feasting on animals and community integration rituals to the cannibalism of dead enemies (Campbell 2007-2008: 113; Campbell 2003: 5; Kansa, Gauld, Campbell & Carter 2009; Kansa, Campbell 2004: 13).

3.8(b) Symbolic Systems

In the Epipalaeolithic, the Natufian period sees a considerable increase in the type and number of artefacts compared to the preceding Kebaran (Akkermans & Schwartz 2003: 27). Of particular interest is the appearance of significant quantities of "art" objects.

Elaborately crafted objects of bone and stone, decorated with detailed abstract patterns and naturalistic scenes, jewellery and three dimensional figurines are seen for the very first time in the Near East at this time (Bar-Yosef 1989, Bar-Yosef & Belfer-Cohen 1989a). The Natufian is merely the prelude; the real explosion of symbolism occurs in the Neolithic: evidenced in all spheres of life and behaviour including burials and portable artefacts, found in both the domestic and public or communal spheres.

Relevance of Symbolism

It was Jaques Cauvin (1994, 2000) who first highlighted the importance of Neolithic symbolism, attributing the "cognitive shift" (as reflected in new symbolic behaviour) in humans as enabling the emergence of agriculture and all associated developments. Initially assigning the "Neolithic Revolution" wholly to the "Revolution of Symbols", he does admit in his post script that both the symbolic and economic spheres are equally important in explaining the Neolithic transition to agriculture (Cauvin 2000: 220; Belfer-Cohen & Goring-Morris 2011: 89). Many other scholars such as Ian Hodder believe it is indisputably clear that the Neolithic of the Near East "is associated with an explosion of symbolism not unlike the cultural explosion that marks the start of the Upper Palaeolithic in Europe (Hodder 2011: 111; also see Wengrow 2011: 153-163).

So why do clay objects appear at the same time as agriculture if they are not related to it? Well quite possibly, they are instead related to associated developments that allowed agriculture to be developed, or the by-products of it. Renfrew (1998: 4) explains that "a new range of opportunities allowing material culture to operate symbolically" only appeared with farming, permanent village settlements and permanent houses and so on. This allowed for the development of "consistent" burial practices, the development of concepts of "the tomb", "the household" and all of the aspects of material culture that settled village life brings. He argues that certain concepts cannot be conceived of by the human mind, without their material culture counterparts, and thus the development of symbolic material culture acted as "external symbolic storage" (Renfrew 1998: 2, 3-4). It is in this context that clay objects emerge, and therefore their timing is not evidence of their utilisation in agricultural administration, but of them being a by-product of settled life. Indeed, all objects in this period can be interpreted as symbolic storage and memory aids (Renfrew 1998).

Evidence of Symbolic systems

Evidence for symbolism is seen in many spheres of Neolithic life (outside of the

mortuary), in both ritual and non-ritual contexts. Wall paintings are one such example; the most extensively preserved and documented are perhaps those from Çatalhöyük East (figure 3.14), yet wall paintings, detailing both geometric and naturalistic designs are found at many other Neolithic sites including 'Dja'de on the Upper Euphrates (Coqueugniot 2000; Le Dosseur 2010: 2) and at Salat Cami Yanı in the Anatolian Lake District (University of Tsukuba 2010a). A dramatic rise in the number of portable "art" objects is seen in the Neolithic in the presence of figurines. Primarily made of clay, they are found in various styles, across the region, almost exclusively in the form of females and animals (main four domesticates). The rendering of males, thou rare, is occasionally evidenced; such as the phallocentric iconography at Çatalhöyük (see Hodder & Meskell 2010: 33-42, fig. 2. 2 p. 35; Rollefson, Simmons & Kafafi 1992: 464-66). Female figurines are found at almost all Neolithic sites, attesting to a shared symbolism and importance of figurines at this time (see figures 3.15 and 3.16).

Grooved stones, incised stones and pebbles are another common form of artefact at sites across the entire Neolithic period. In the southern Levant in particular, naturally shaped river pebbles, incised with either geometric designs (figure 3.17a-c) or anthropomorphic features (female) (figure 3.17d-f) are common, as seen from the 9th millennium sites of Gilgal (I and III) and Netiv Hagdud, into the 6th millennium BC at Sha'ar Hagolan for example (Garfinkel 1999: 70-89; Garfinkel, Ben-Shlomo & Korn 2010: 123-216; Garfinkel & Miller 2002a: 32-33, figs 2. 33-2. 35 p. 33; Garfinkel, Korn & Miller 2002: 204-06, figs. 13. 27-13. 29, Gopher 1997: 151, 167, 170-71, fig. 5. 18 p. 171; Hershman & Belfer-Cohen 2010: 195-96, 203, fig. 11. 8 nos. 5, 6, figs 11. 13 no. 3 & 11. 15). Similarly**,** hand-sized grooved and incised stone artefacts; interpreted as "shaft-straighteners" appear at many sites across the entire region and temporal scale of the Neolithic Near East (i.e. Boncuklu Höyük, Pınarbaşı and Aşıklı Höyük: Anatolia, Gesher, Sha'ar Hagolan, Gilgal: South Levant. See figure 3.18 and figures 4.1-7 to 4.1-9). Some are plain aside from the groove, yet many display complex geometric (and occasionally naturalistic) patterning on the reverse; interpreted as an identity marker linked to a hunting role (i.e. Garfinkel 2002a: 184-85, fig. 12. 6 p. 185; Garfinkel 1999: 39; Gopher 1997: 162-63; Hershman & Belfer-Cohen 2010: 163-64, fig. 9. 13 p. 162). The motifs seen on these items appear across all Neolithic sites, not only on pebbles and stones, but the patterns are repeated on wall paintings and public architecture for example.

Large scale sculpture mirrors the themes seen above, with carved standing stones depicting wild animals and the human form seen at a handful of sites (namely within

cult structures at Nevalı Çori and Göbekli Tepe described earlier in this chapter). Additionally, large installations inside buildings such as auroch horns and animals sculpted in relief, point to the importance of cattle and wild animals in belief systems of the Neolithic. Çatalhöyük has many such examples of installations. Pairs of horns, "bucrania", with the central skull still attached are placed in moulded installations within buildings, alongside furnishings involving other wild animals (such as cattle, bears and tigers) created from plaster and brightly painted (figure 3.19). Aside from stone and clay, the human form is rendered large scale in the near life size portable statues from PPNB 'Ain Ghazal (Horwitz & Goring-Morris 2004: fig. 7, 173-74).

Other aspects of symbolic behaviours; performance and display in the form of song, dance, drama and costume for example are mostly lost to the archaeological record, but certain lines of evidence hint that symbolic behaviours of this kind were strong elements of Neolithic culture. Performance may have functioned in a symbolic fashion, as part of ritual activity, perhaps used to mark a change in status and relationships, especially those transitions seen at death. Costume in the form of animal skins, feathered headdresses, masks, body paint and tattoos are all hinted at in the archaeological record. They can be seen in many examples of wall paintings at for example Çatalhöyük (paintings depict men in headdresses and wearing leopard skins around their waists in a "tutu" style: Mellaart 1967: 131-77, pls. 61-63), in depictions on pottery and in the presence of stone masks (such the 7th millennium BC example from Nahal Hemar cave; (Bar-Yosef & Alon 1988: 23-27, pl. 11. 1-11. 3; Bienhert 1990: 259; Ornan 1986: 18-19). All suggest the presence of such elements of performance culture was widespread. Some of the so-called stamp seals were perhaps used to stamp designs onto the body, or fabrics (see Chapter 4. 2) (Mellaart 1967: pl. 121, and Mellaart 1964a: 96, 98 figs 40-41). The venues for such ritual performances are also present in some of the probable "ritual" buildings of the Neolithic, such as those at Nevalı Çori, Çayönü and Göbekli Tepe.

The brief survey above highlights the abundance of evidence for ritual and symbolic activities within the Neolithic, the scale of which demonstrates the importance of symbolic ritual activity within early village communities, in both the mortuary realm, and other spheres of life. Clearly symbolism was widespread, and ritual practice formed part of day to day life. Small geometric clay objects could certainly have been utilised as part of these activities.

ILLUSTRATIONS

FIGURES:

(a)

(b)

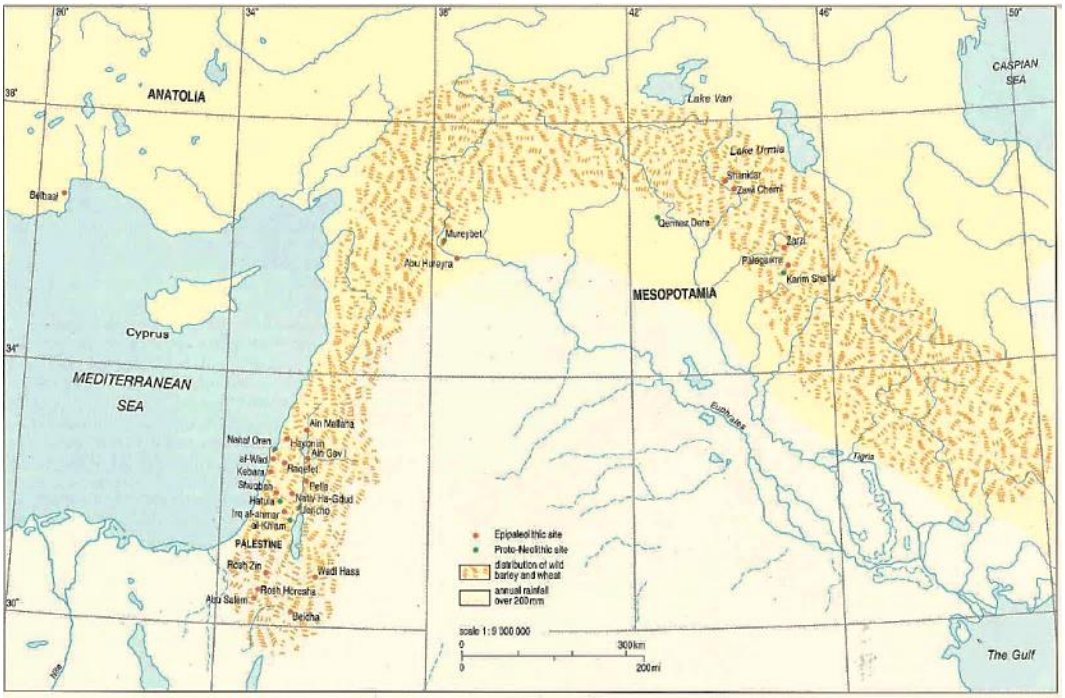


Figure 3.1: (a) Geographical map of the modern Middle East showing the region and main features covered. **(b)** Map of the Near East with the 200m isohyet-the limit of dry farming marked arching over the region. (Roaf 1990: 12-13, 24).

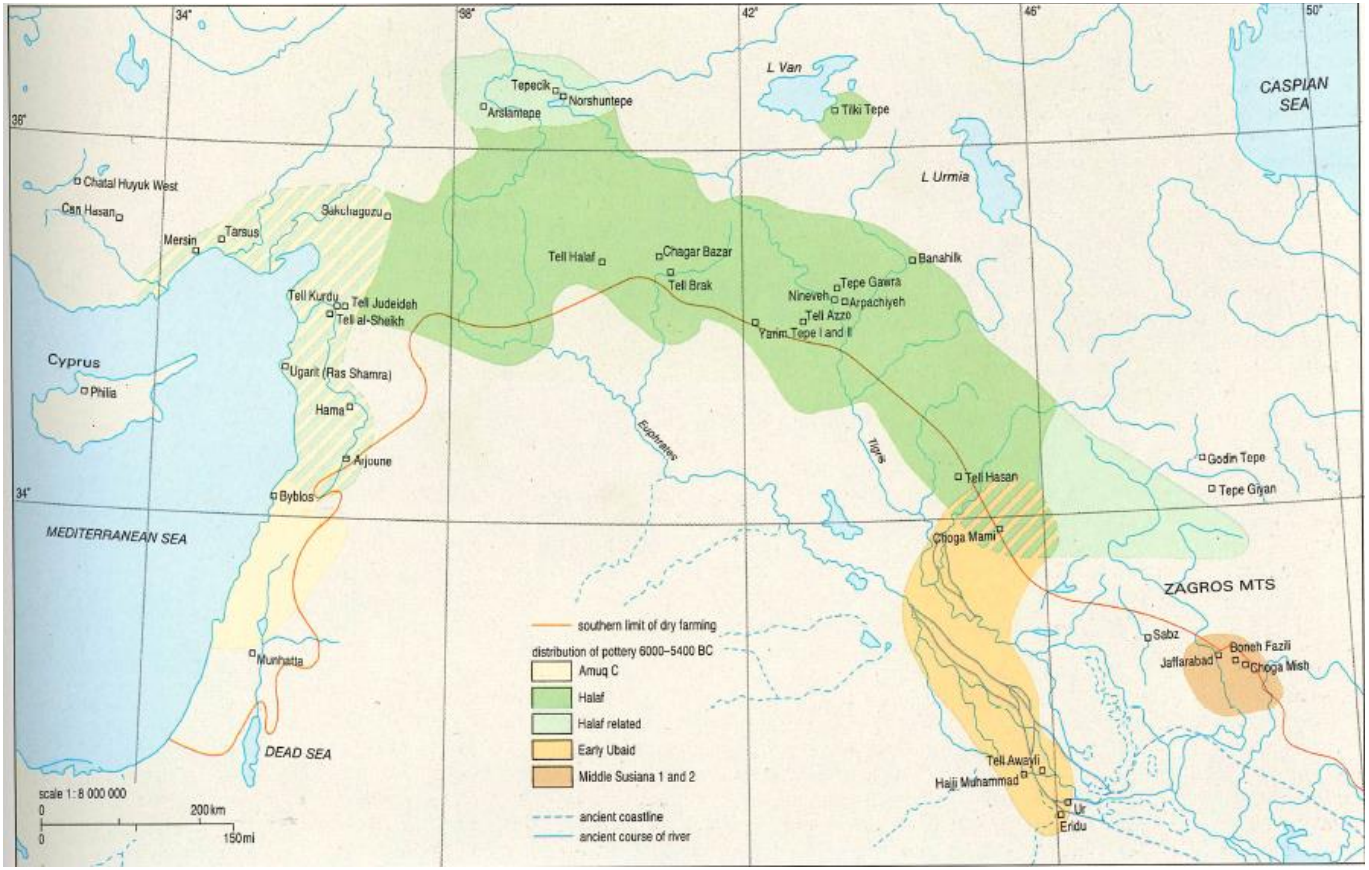
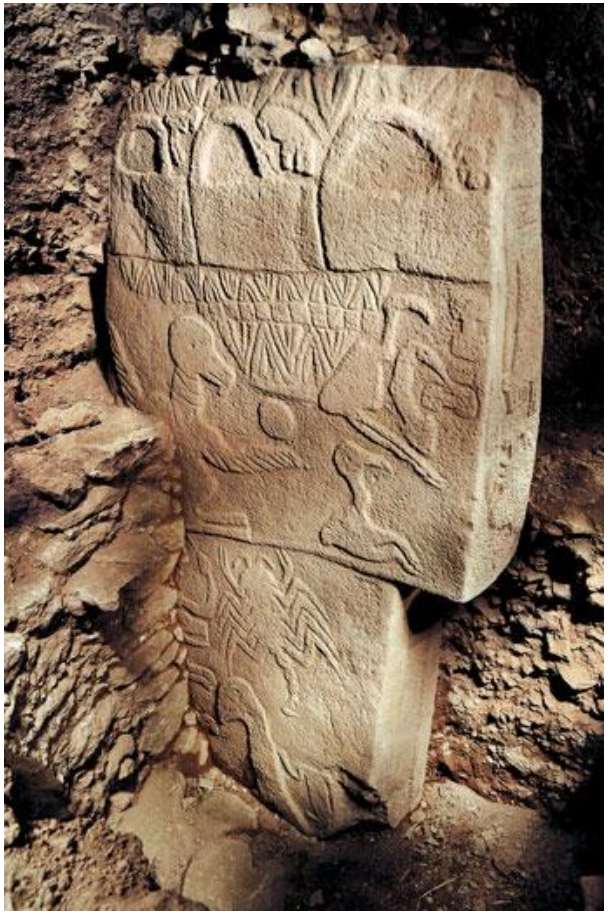


Figure 3.2: Location of the Halaf "Cultural" zone within the Near East (Roaf 1990: 49).

(a)



(b)

(c) **(d)**

Figure 3.3: Sculpture in the form of monoliths, pillars and free standing sculpture from the southeast Anatolian site of Göbekli Tepe (mid 10th to late 9th millennium BC). **(a)** View of one of the two spaces (or "temples") and the containing monoliths, **(b)** ducks and scorpions, **(c)** male lion and **(d)** lizard sculpture in 3D on a monolith. (Curry 2008).

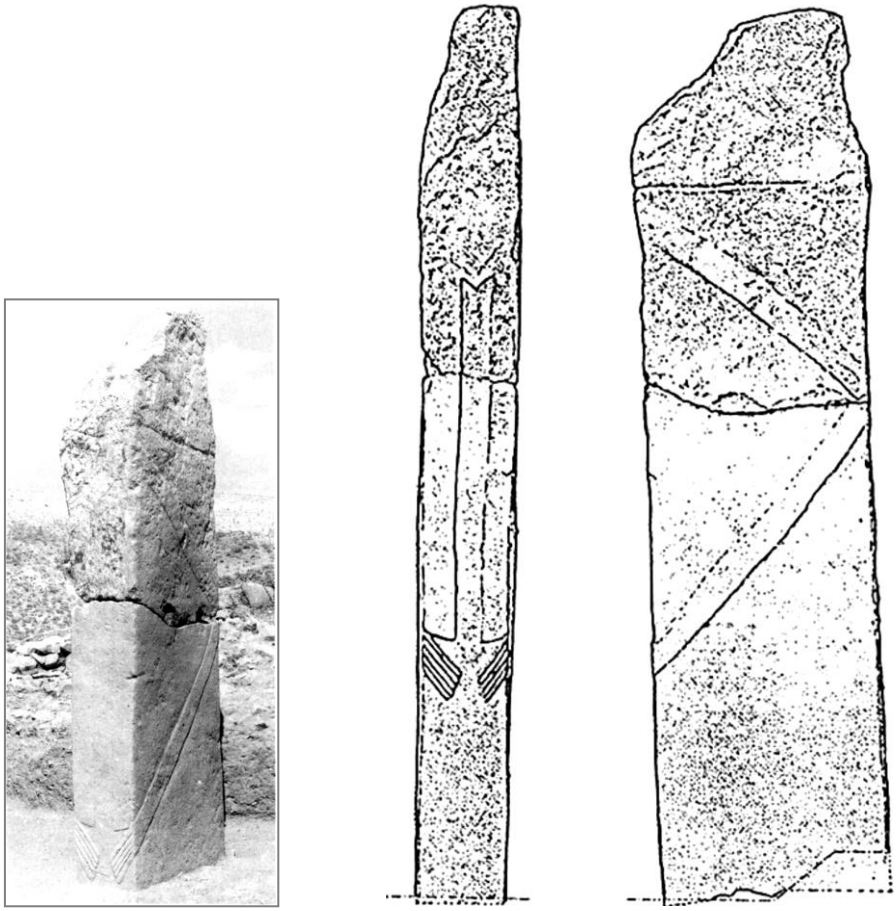


Figure 3.4: Stylised male human in raised relief (photograph and sketch), from 9th millennium BC (PPNA) Nevalı Çori. One of two stelae found in the centre of "ritual" building III. The stela is monumental, acting as a roof support. (Photograph Mellink 1990: 1 p. 128, drawing Kornienko 2009: fig. 8.2 p. 94).

Figure 3.5: Detail of a storage bin from the Aceramic "Shrine Phase" of the Central Anatolian site of Höyücek. Plate construction of the clay storage "boxes" or silos can clearly be seen in the holes at the top of this slab. Also see figure 9.41 Chapter 9 (Umurtak 2007: fig. 6 p. 14).

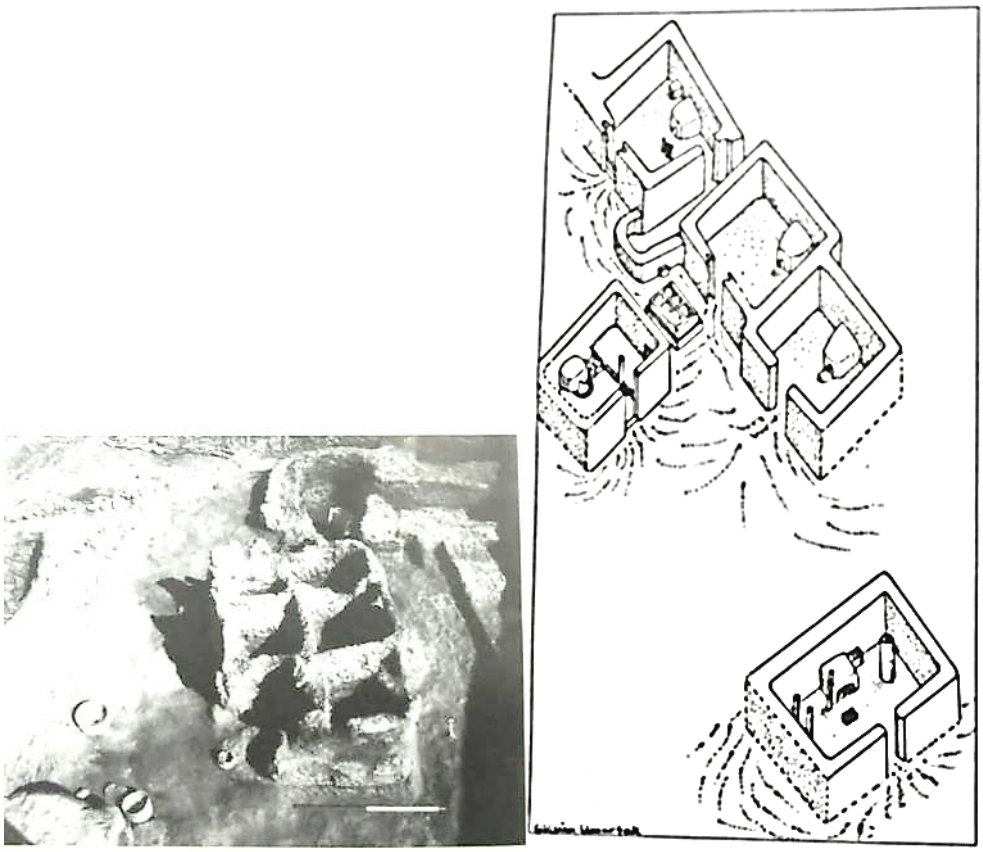


Figure 3.6: Set of six clay storage boxes from level EN2/III at the central Anatolian, Aceramic Neolithic site of Bademağacı. The isometric drawing shows the boxes location on site; in an open space between two residential units. (Umurtak 2007: 12 figs. 2a-b).

(a)

(b)

(b)

Figure 3.7: (a) Storage areas within a residential structure at the MPPNB site of Ghwair in the Southern Levant. A row of storage bins can be seen (top) attached to one domestic unit. Another has a circular room, attached to which are three small square bins (each less than 1 x 1m). **(b)** Substantial storage buildings at MPPNB Ghwair; likely the lower floor of a residential unit. These features are common at Ghwair, and bear striking similarities to structures such as the Pier Houses evidenced at contemporary Beidha (see figure 3.4). (Photographs: author's own).

Figure 3.8: Remains of the basement/ground floor storage level of a typical rectilinear building at MPPNB Beidha. A central corridor provides access to six compartments, three on each side. Measuring just 1m x 1m on average, a storage function is suggested, with living space on the floor above. (Photograph: author's own).

Figure 3.9: (Left) modern example of a large capacity storage basket (the main section of the central basket stands at just over 1m tall, with a maximum diameter of 0.60m); traditional design made in the Republic of Senegal, West Africa. (Photograph, author's own). **(Middle** and **right)** Halaf pottery wares; 6th millennium cal. BC levels at Tell Sabi Abyad. The designs on these examples likely imitate basketry vessels (SAB-FB 2014).

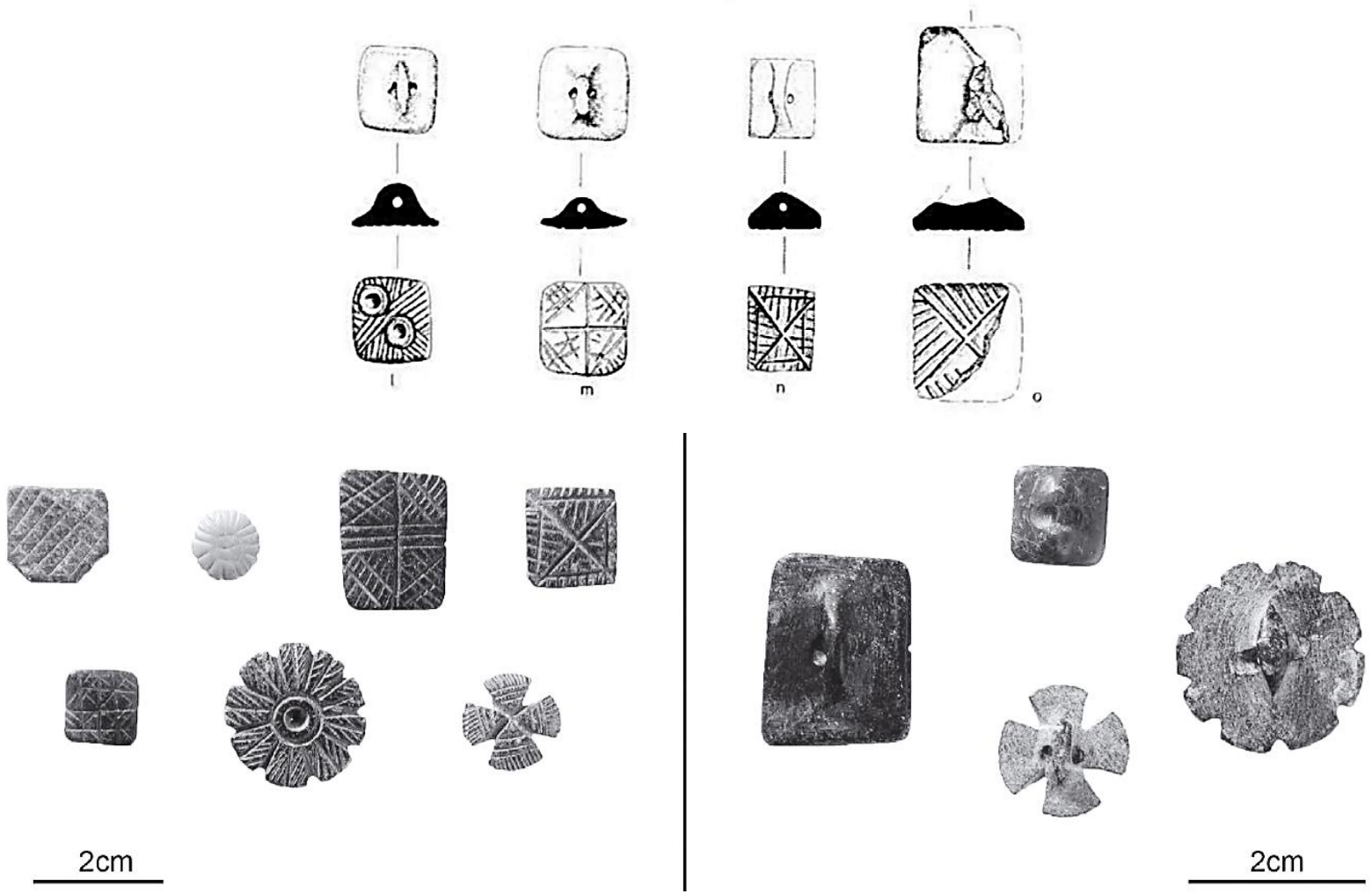


Figure 3.10: Stamp seals of the Halaf period, 6th millennium cal. BC. **(Top row)** illustration of a selection from Domuztepe. **(Bottom/photographs)** range of seals from Domuztepe. (Belcher 2011: fig. 9 p. 139, adapted from Carter, Campbell & Gauld 2003: fig. 9 p. 139).

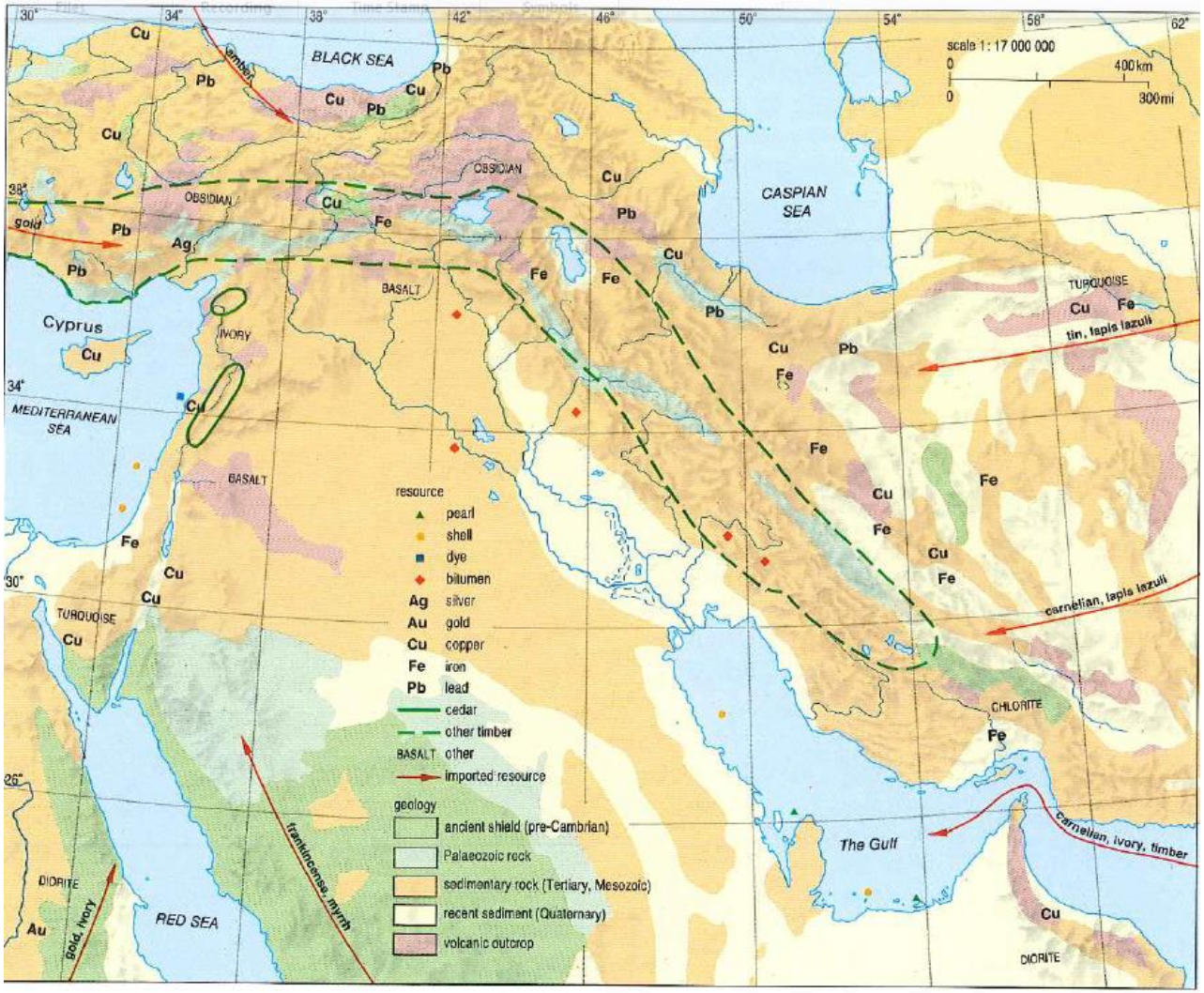


Figure 3.11: Map of the Near East showing the natural resources of the region in the Neolithic. (Roaf 1990: 35).

(a) **(b)** **(c)** **(d)**

(e) **(f)** **(g)** **(h)**

Figure 3.12: Craft items from Salat Cami Yanı, Anatolia; demonstrating the skill of craft and range of raw materials in circulation in the Neolithic: **(a)** Clay beads, **(b)** & **(c)** stone beads, **(d)** bone beads, **(e)** &**(f)** bone tools, **(g)** clay figurines**, (h)** stone vessel fragments. (University of Tsukuba 2010b).

Figure 3.13: (Top) cache of 8 skulls buried together (D35-44 of phase DI.xxix-xxx), viewed from above. **(Bottom)** two plastered painted and decorated skulls from PPNB (c. 9th/8th millennium cal. BC) Jericho, Southern Levant. Skull D 112 (Reg. 532) *in situ* and Skull D 111 (Reg. 534) (Kenyon 1981b: pls. 36a, 51a & 57c).

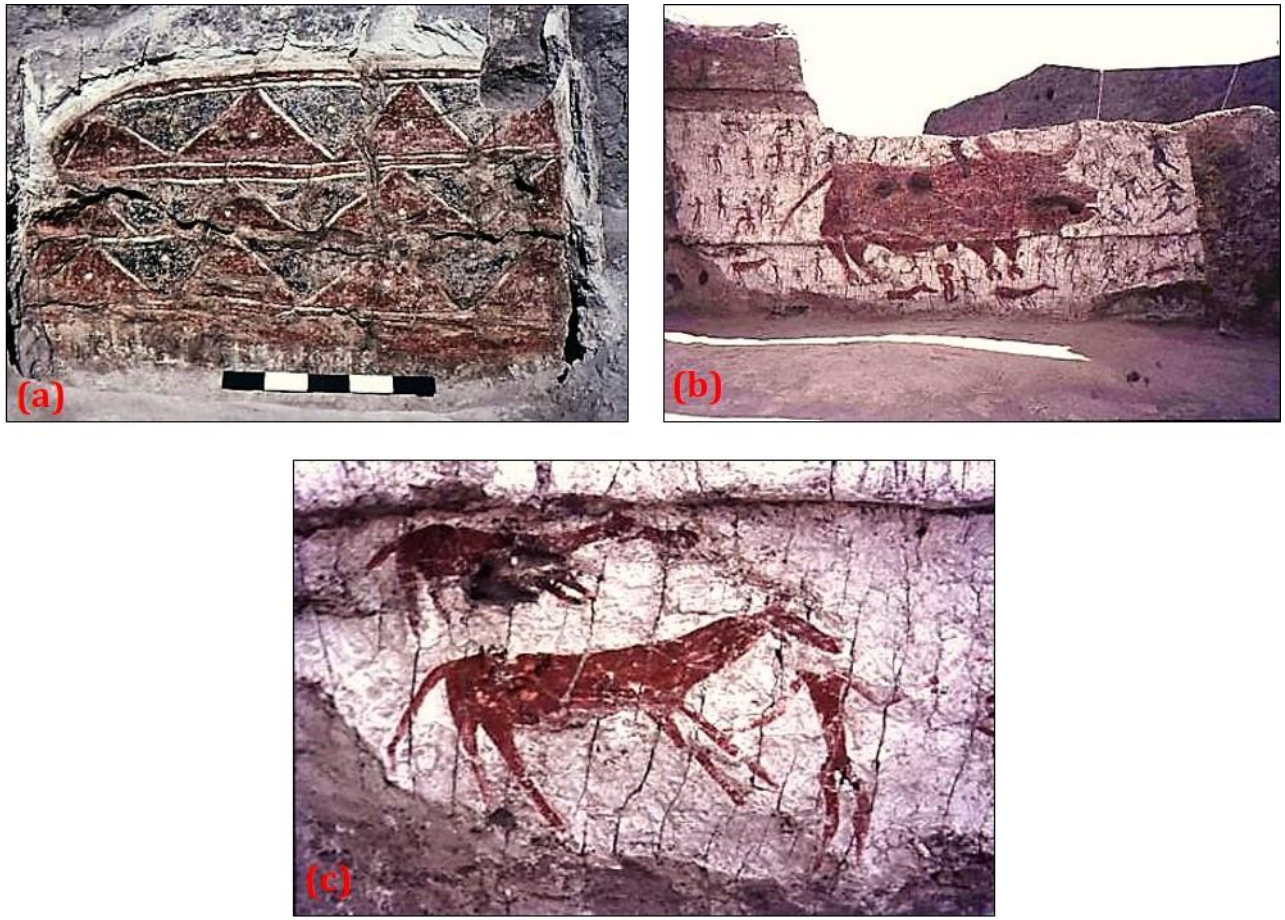


Figure 3.14: Wall paintings from Çatalhöyük East (mid 8th to late 7th millennium BC). Wall paintings are found inside every domestic building; **(a)** geometric designs are common at this site, alongside naturalistic hunting scenes as seen in the boar **(b)**, and the deer hunt **(c)**. All three were found in domestic buildings in the South Excavation Area. (**(a)** Mellaart 1967: pl. VIII. **(b)** and **(c)** Original James Mellaart excavations, courtesy of the Çatalhöyük Research Project).

Figure 3.15: Selection of "ritual" objects from Höyücek's "sanctuaries". These idols and figurines were found in-situ with clay geometrics in the final Neolithic phase of settlement; the Sanctuaries Phase (Duru 2007b: 329-30).

Figure 3.16: Examples of female figures from various Neolithic sites in the Near East: **(a)** Çatalhöyük Female figurine with body adornment in the form of clothing or paint depicted. (Mellaart 1967: pl. 73). **(b)** Woman and child figurine in clay. Hacilar. Height 8.3cm. **(c)** Sha'ar Hagolan female figurine (mid-late 6th millennium BC, southern Levant). (Stekelis 1972 pl 67). **(d)** Sha'ar Hagolan female figurine. (Stekelis 1972 pl 65. See also pl. 49, 50 & 66 from the same site).

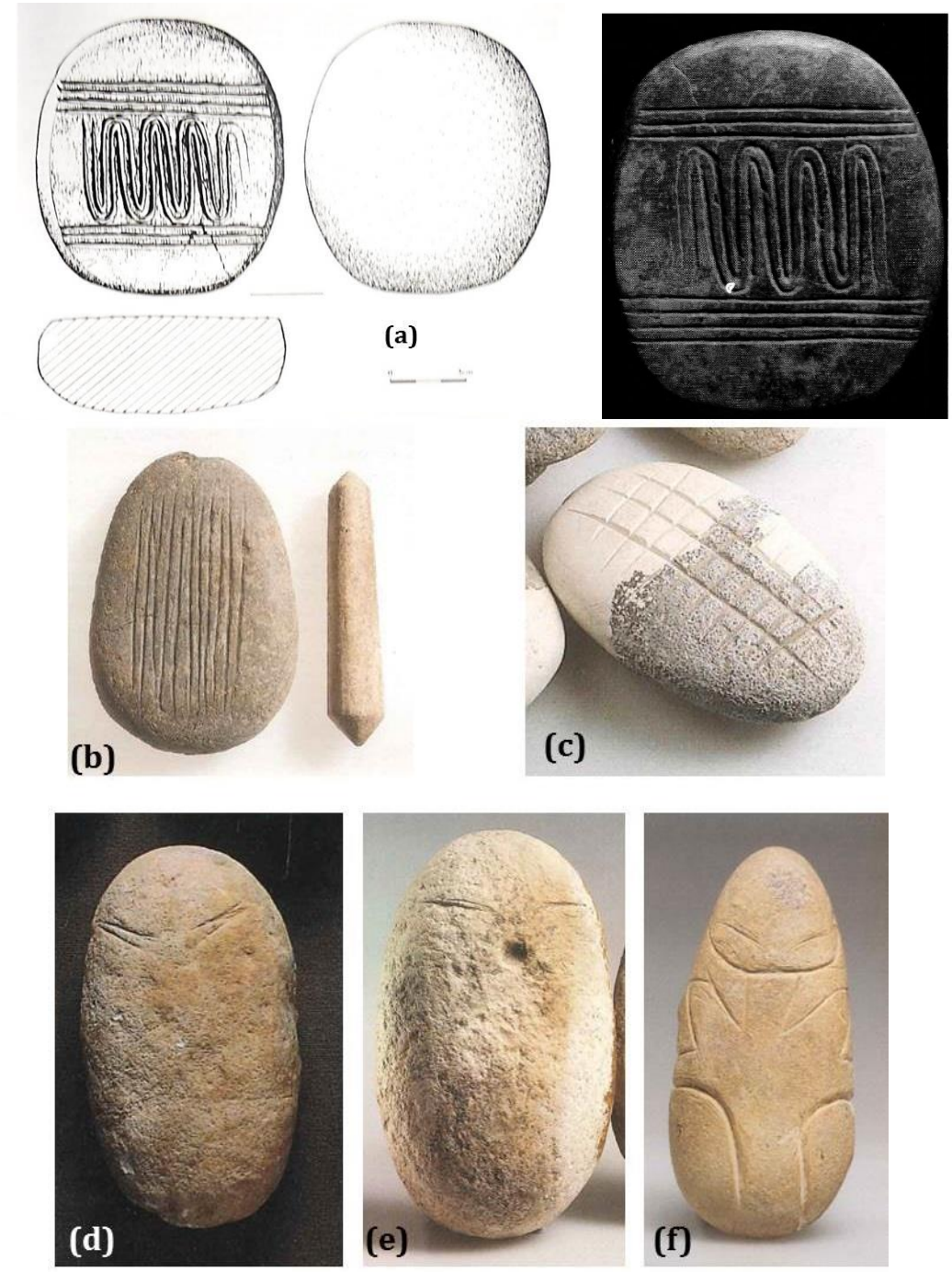


Figure 3.17: Naturally shaped river pebbles, incised with geometric patterns and female, stylised anthropomorphic features. **(a)** Geometric pebble from Netiv Hagdud, Southern Levant (occupation dates from 9,400± 180 to ± 9,970 ±150 BP (uncalibrated)). (Gopher 1997: fig. 5.18 p. 171). **(b)** & **(c)** Geometric pebbles from Sha'ar Hagolan (mid-late 6th millennium BC, southern Levant). (Garfinkel 1999: (a) adapted from p. 88. (b) p. 89-bottom). Anthropomorphic (female) pebble figurines from Sha'ar Hagolan; measuring **(d)** 10.9 x 6.3 x 3.9 cm (Garfinkel 1999: bottom no. 2 p. 85), **(e)** 13.0 x 7.6 x 5.3 cm (Garfinkel 1999: no. 1 p. 83) and **(f)** 9.0 x 4.2 x 3.3 cm (Garfinkel 1999: p. 74).

Figure 3.18: Decorated, portable shaped stone artefacts. **(Top)** Decorated grooved stone/shaft straightener from 9th millennium BC Pınarbaşı, Central Anatolia (Adapted from Baird 2012a: fig. 8 p. 213). **(Bottom)** Incised and decorated shaft-straightener from Aşıklı Höyük, Central Anatolia (Özbaşaran 2012: fig. 18 p. 157). Also see figures 4.1-7 to 4.1-9, Chapter 4.

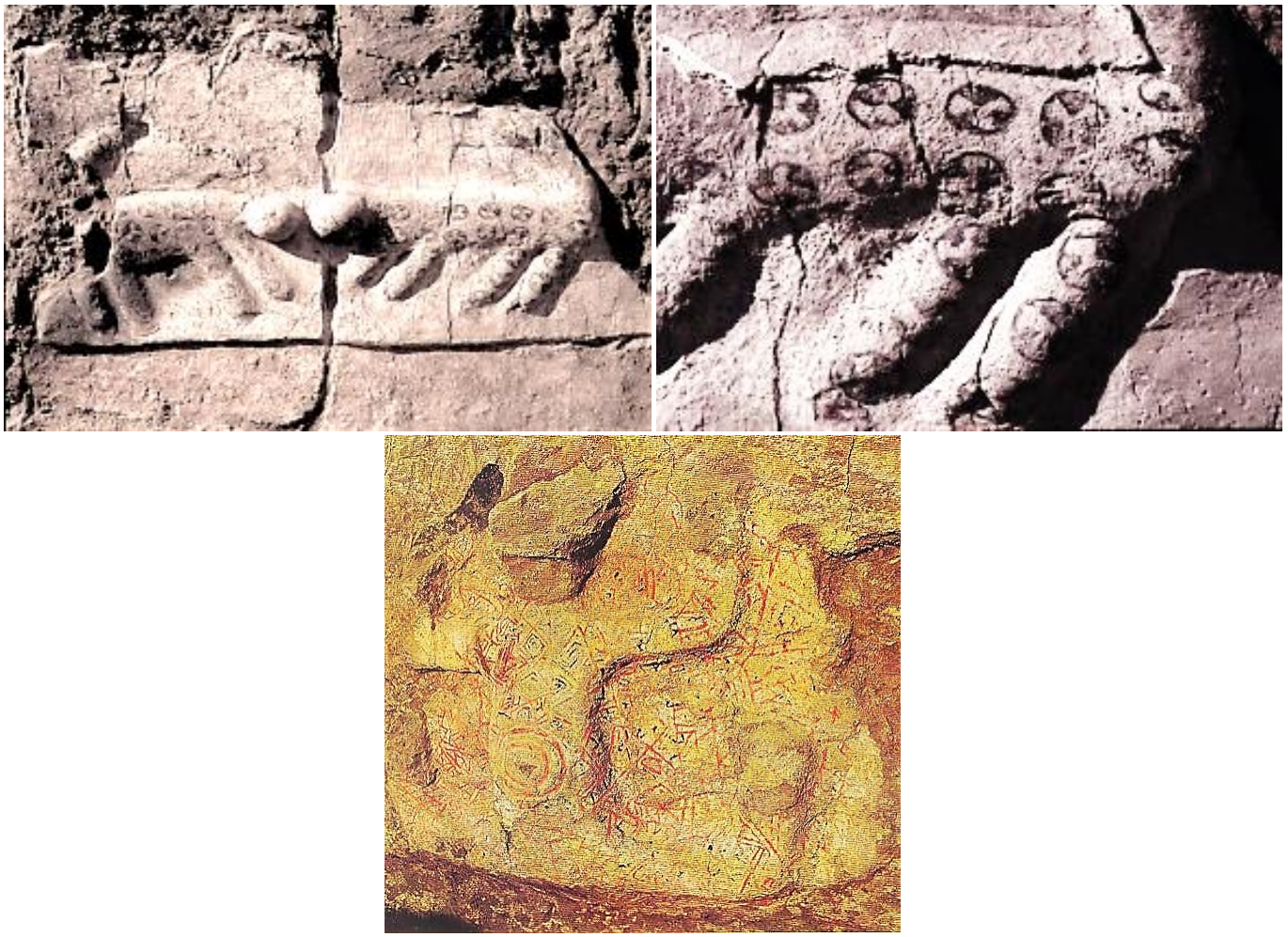


Figure 3.19: Installations from Çatalhöyük East (mid 8th to late 7th millennium BC), uncovered by James Mellaart in the original 1960's excavations. Such installations are fairly commonplace, though not found in every building unlike wall paintings. **(Top)** facing leopards (left) with detail (right) (Original James Mellaart excavations, courtesy of the Catalhöyük Research Project). **(Bottom)** Bear? Originally identified by Mellaart as a pregnant woman. East wall, shrine VII.23. (Mellaart 1967: Pl. VII).

TABLES:

LEVANT				ANATOLIA			
DATE		PERIOD/CULTURE		DATE	TRADITIONAL TERMINOLOGY	DATE	EARLY CENTRAL ANATOLIAN (ECA) CHRONOLOGY
12,500 - 10,500 BC		NATUFIAN		Ends c. 9,000 BC	LATE OR EPI-PALAEOLITHIC	10,000 - 9,000 BC	ECA I
10,500/9,800 - 8,550 BC		PPNA					
8,550 - 6,750 BC		PPNB:		9,000 – 7,000 BC	ACERAMIC NEOLITHIC	9,000- 6,600 BC	ECA II
	8,550 – 8,100 BC	~EARLY PPNB					
	8,100 – 7,300	~MIDDLE PPNB					
	7,300 – 6,750	~LATE PPNB					
NORTH LEVANT & MESOPOTAMIA		SOUTH LEVANT					
DATE	PERIOD/CULTURE	DATE	PERIOD/CULTURE				
c. 7,000 BC	POTTERY WIDESPREAD	7,000-6,500/6,300	PPNC	c. 7,000 BC		POTTERY WIDESPREAD	
6,300 - 6,000 BC	EARLY CERAMIC NEOLITHIC/ HASSUNA & SAMMARA (Restricted geographical zone)	c. 6,000/5,700 BC	POTTERY WIDESPREAD	c. 7,000 BC onwards	CERAMIC/POTTERYNEOLITHIC (CN/PN) (Often divided into Early, Middle and Late)	6,600 - 6,000 BC	ECA III
6,000 - 5,200 BC	CERAMIC/POTTERY NEOLITHIC (CN/PN) OR HALAF (Restricted geographical zone)	6,300 - 5,700 BC	YARMUKIAN/ EARLY PN			6,000 - 5,500 BC	ECA IV
						5,500 - 4,500 BC	ECAV

Table 3.1: Neolithic Near East Chronology. Traditionally applied temporal schemes and approximate corresponding calendar dates (in years calibrated BC) for the South Levant, North Levant and Central Anatolia. (adapted from Akkermans & Schwartz 2003: figs. 302, 4.2, Garfinkel & Ben-Shlomo 2002: 71, Gerard 2002: 108, Kuijt & Goring-Morris 2002: table 1, Özdoğan & Basgelen 2007: insert, Özbaşaran & Buitenhuis 2002: table 2 p. 69, Rollefson, Simmons & Kafafi 1992: 447).

SCHOLAR	THEORY	ARGUMENT	REFERENCE
Vere Gordon Childe	Oasis Theory	• Environmental desiccation. • Humans and animals forced to oasis for survival. • Restricted mobility, competition between humans and animals, and closeness of humans to nature led to agriculture.	*The Most Ancient Near East* (1928). *Man Makes Himself (*1936).
Robert Braidwood	Nuclear Zone	• No significant climate change. • Technological advancements allowed adoption of agriculture. • Closeness of humans to animals in their naturally restricted "nuclear" zones allowed their domestication once humans were "ready".	*The Agricultural Revolution* (1960a).
Lewis Binford	Marginal Zone	• Late Pleistocene-early Holocene saw improving conditions, no desiccation. • Resultant resource abundance led to reduced mobility. • Increasing human longevity led to population increase and eventual strain on resources and relations. • People forced out into "marginal zones", taking plants and animals with them leading to herding, cultivation and eventual domestication.	"Post-Pleistocene Adaptations" in *New Perspectives in Archaeology*, eds. S. Binford & L. Binford (1968).
Barbara Bender	Social Theory	• Social circumstances necessitated transition to agriculture. • Certain individuals acquired surplus food, in order to manipulate others into carrying out tasks and to trade for other materials. • The accumulation of seasonal products necessitated storage, increased sedentism, cultivation and eventually domestication.	*Gatherer-hunter to Farmer: A Social Perspective* (1978).
Brian Hayden	Big Men	• Competition and the feasting aspect of it led to agriculture. • Accumulators or "big men" amassed and took control of surplus food (especially in resource rich areas). • Held feasts in order to increase their status, gain power and maintain loyalty. • The need for surplus, and also rare, tastier more socially valued foods led to cultivation, herding and domestication.	*Nimrods, Piscators, Pluckers, and Planters: the Emergence of Food Production* (1990).
Jaques Cauvin	Revolution of Symbols	• Rejects economic explanations. • Cognitive shift in humans enabled agriculture. • The "revolution of symbols" which took place before the emergence of agriculture was the necessary prerequisite, enabling the transition to sedentary farming life. • Views the symbolic sphere equal to, if not more important than economic developments in explain the origins of agriculture.	*Naissance des divinités, naissance de l'agriculture: la révolution des symboles au Néolithique* (1994). Translated into English as published as: *The Birth of the Gods and the Origins of Agriculture,* (2000).

Table 3.2: Chronological summary of the most influential, mainstream paradigms seeking to explain the origins of agriculture in the Neolithic Near East (Bender 1978, Binford 1968, Braidwood 1960a, Cauvin 2000, Cauvin 1994, Childe 1936, Childe 1928, Hayden 1990).

CHAPTER 4: CASE-STUDY SITE OVERVIEWS

Boncuklu Höyük, Çatalhöyük and Tell Sabi Abyad constitute the case-study sites. See figure 4.1 below for their location.

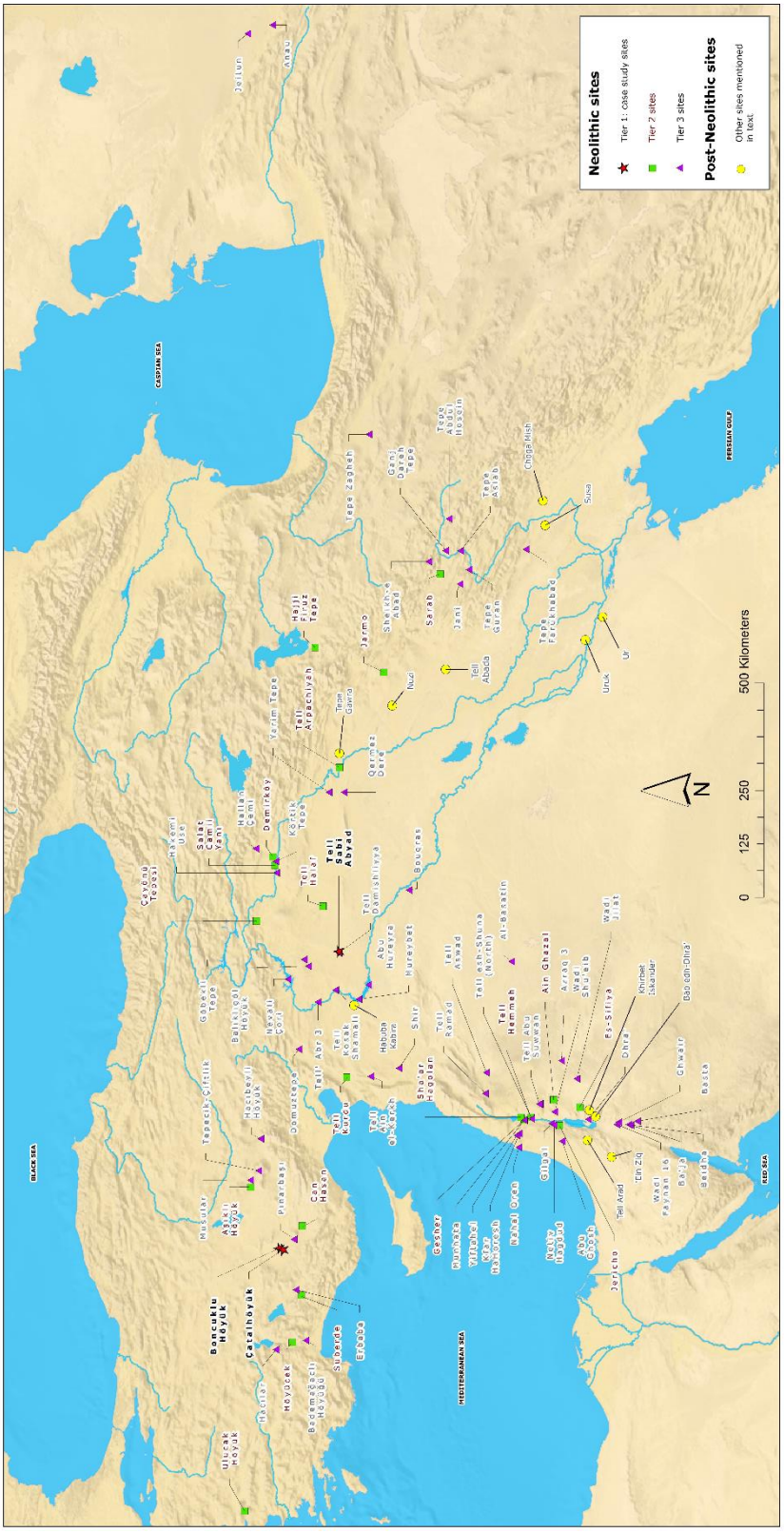


Figure 4.1: Map of the ancient Near East showing the location of the sites discussed in the text. See Chapter 5: Methodology for explanation of the tiered system of site categorisation. (Made with Natural Earth vector and raster map data from @naturalearthdata.com. with the kind assistance of Dominic Baker).

CHAPTER 4.1: BONCUKLU HÖYÜK

4.1(a) LOCATION AND DISCOVERY

Boncuklu Höyük was discovered in 2001 by Professor Baird of the University of Liverpool as part of the 2001 Konya Plain Survey Project (figure 4.1-1) (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 221). It is located in the Konya Plain, central Turkey, approximately 9.5 km north east of the larger, well known, Neolithic site of Çatalhöyük (figure 4.1-2). Intensive surface collection recovered lithics and decorated stones identical to those from the nearby sites of Can Hasan III, Pınarbaşı, and the earliest levels of Çatalhöyük East (figures 4.1 and 4.1-2), suggesting a contemporary Neolithic occupation (Baird *et al.* Forthcoming, Baird, Fairbairn *et al.* 2012: 222-23). Boncuklu Höyük is situated on a marl rise, providing a good view over the plain, in addition to lifting the site above the marshy surrounds of the Holocene (as suggested by Boyer, Roberts & Baird 2006 and corroborated by site data).

Excavations began at Boncuklu Höyük in 2006 and are ongoing (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 222). Over the last 9 seasons of work, various excavation areas have been opened and other areas surface scraped (Areas Y, N, and O). Area X on the edge of the höyük was sectioned in order to investigate the occupation sequence (see figure 4.1-3. Baird *et al.* Forthcoming; Baird 2012b; Baird 2012c; Baird 2010; Baird 2009; Baird 2008; Baird 2007; Baird 2006; Baird, Fairburn *et al.* 2012; Baird *et al.* 2011). Thorough excavation methods at Boncuklu, aided by the project's research aims (see below) include the sieving or floating of 100% of excavated sediment. Within each excavated context, 50% of sediment is sieved (alternately wet and dry) and 50% floated; with 100% of sediment from special features floated (Baird pers. comm.). The heavy residue (non-floating material resulting from the flotation process) is then sieved and separated into four size categories; greater than 4mm, less than 4mm and greater than 2mm, less than 2mm and greater than 1mm and less than 1mm. Each is processed by hand, retrieving all kinds of material culture fragments (Baird pers. comm.).

4.1(b) PROJECT AIMS AND RESEARCH CONTEXT

The project aims are twofold. Firstly, to document and explain the appearance of sedentary herding and cultivating communities in Central Anatolia, the initial appearance of which has been hitherto poorly documented (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 219). Secondly, to investigate the antecedents of Çatalhöyük, and Boncuklu's interactions with contemporary neighbouring sites. Many explanations have been proposed for the when, how, and why of the development of

sedentism, cultivation, and herding in Central Anatolia and the Konya Plain is key to understanding this (Colledge *et al.* 2004). Cultivation is evidenced in the first half of the 8th millennium BC at Aşıklı Höyük (Cappadocia), and is likely seen in Çatalhöyük's earliest levels (Asouti & Fairbairn 2002: 184; Baird, Fairbairn *et al.* 2012: 220). Likewise caprine herding is attested at Çatalhöyük's earliest levels (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 220; Martin *et al.* 2002: 197). Occupation at Boncuklu Höyük has a distinct relationship with two key sites: the earliest settlement at Boncuklu Höyük is contemporary to nearby 9th millennium BC Pınarbaşı (see below for full discussion), allowing site interactions and the movement of people across the landscape to be studied (Baird *et al.* Forthcoming; Baird 2012a: 183, 192; Baird, Fairbairn *et al.* 2012: 221, 233, Watkins 1996). Boncuklu is the immediate predecessor of Çatalhöyük, thus allowing for the origins of behaviours evidenced at there to be traced (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 221, 233). Results from Boncuklu Höyük to date illustrate the spread of farming in Central Anatolia, and shows that farming was adopted by indigenous foragers rather than being introduced by farmers from outside of the region (Baird *et al.* Forthcoming; Baird Forthcoming; Baird, Fairbairn *et al.* 2012: 219).

4.1(c) SITE LAYOUT AND STRATIGRAPHY

Boncuklu Höyük is a typical Neolithic mound, currently sitting two metres above the Konya Plain, and covering over one hectare in area. Neolithic settlement has been dated from the mid-9th to the mid-8th millennium cal. BC (equivalent to the Early and Middle PPNB of the Levant). Carbon 14 dating of the earlier levels of occupation provides dates of 8,400-7,800 cal. BC, with the latest levels of occupation estimated to have ended by 7,500 cal. BC (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 221). As such, Boncuklu Höyük's earliest levels are contemporary to the neighbouring 9th millennium site of Pınarbaşı (24.5 km to the south and dated to 8,500-8,000 cal. BC, see later in this section). The later levels of Boncuklu predate the earliest settlement at Çatalhöyük East by just few hundred years (Baird *et al.* Forthcoming; Baird 2012: 192; Baird, Fairbairn *et al.* 2012: 221, 232, 233; Watkins 1996). Though in general, the Neolithic material is undisturbed by later activity, the edge of the site (in the vicinity of Area X, see figure 4.1-3) has been cut into in modern times to create a field. The section in Area X also revealed disturbance by later (likely Byzantine) burials and it was clear the entire site had been bulldozed, removing the late Early Bronze Age deposits (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 222, 223). Unlike the densely arranged buildings of Çatalhöyük, settlement at Boncuklu Höyük is small and far simpler in many

aspects. Boncuklu is low density, in the form of a small number of curvilinear structures, clustered together, and separated by large, open midden areas (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 223, 224, 226, 233). Absent are signs of "corporate" or "public" buildings and social stratification.

4.1(d) ARCHITECTURE & SYMBOLISM

Architecture at Boncuklu Höyük is exemplified by a sequence of 6 buildings in Area K – which represent the earliest phase of settlement excavated thus far (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 226). Clear similarities to buildings from contemporary Aşıklı Höyük and later Çatalhöyük are seen, along with some stark differences. In sequence from earliest to latest, built on top of one another are Buildings 2, 9, 7, 3, 1.1 and 1.2. These oval shaped buildings have mudbrick walls, marl plastered floors and measure 3 m by 5 m on average. The first in the sequence, Building 2, has distinctive clay walled features, which appear to be ovens or possible storage bins, the latter of which are very rare elsewhere at Boncuklu (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 224). Building 9, which is cut into Building 2, illustrates the typical and consistent use of interior space across the site, with well-preserved floors and a clear distinction of space. The southeastern portion of Building 9 has flat, hard, white plastered surfaces which are extremely clean. In contrast, the northwest area has a lower floor level, undulating and covered in occupational debris. In this area is situated a hearth, surrounded by post holes and lined in places with river pebbles. It seems the northwest part of buildings were used for cooking and food preparation in contrast to the clean southeastern areas which were utilised for sleeping and other activities (figure 4.1-4; Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 224-25, 226).

The sequence of buildings in Area K demonstrates the distinct and consistent use of space at Boncuklu Höyük. Structures exhibit building and rebuilding to the same alignment, on the same spot, and with the same internal use of space. Hearths are repeatedly placed in the same location, posts are located on the south wall only and paintings where present, are found only on the north walls and floors (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 224-25, 226, 227). The penultimate building of the sequence, Building 1.1, continues the tradition of continuity. It also displays one of the best examples of reed matting, common at Boncuklu, in the form of phytoliths illustrating a tabby weave patterning, as also seen at Çatalhöyük (see figure 4.1-5; Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 226; Wendrich 2005: 336). Building 1.1

also contains Burial G12, delineated by a slumped floor in the south. The sequence of three buildings (Buildings 8, 5 and 4) in Area H demonstrate the same trends seen at Area K (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 227-28).

Unlike neighbouring Çatalhöyük, few possible storage facilities are found on-site, either within buildings or in external areas. Built-in storage bins or annexes are absent aside from the possible bin in Building 2 (Area K). In addition, in the 2012 excavation season a possible annex, which may have served for storage was located attached to the eastern side of Building 6, Area N (figure 4.1-4). The beginnings of the extensive symbolism found at Çatalhöyük are seen at Boncuklu Höyük, in the floor of a number of structures. An area of the floor within the northern part of one of Area H's buildings displays red ochre mixed into the floor make up, resulting in a red patch of plaster (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 227). Similarly, in Building 1.2 (Area M) red ochre has been painted directly onto the north floor and part of the lower north wall (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 226, 228). The north wall of this latter building also had a plaster installation in the form of protrusions moulded in relief and painted red (figure 4.1-6) (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 226-27).

In summary, the architecture of Boncuklu displays continuity in terms of the repeated rebuilding of structures on the same spot, and to the same alignment again and again (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 226). The structured use of space is also clear, both features which are heavily mirrored at Çatalhöyük (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 226; Hodder 2006: 119-122, 151). Burials, like at Çatalhöyük, are found under house floors (see below), and this along with the presence of plaster installations and painted walls and floors are the beginnings of a symbolic practice, one which is expanded upon at later Çatalhöyük, from it's earliest levels (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 226). What differs from Çatalhöyük is the sparse distribution of buildings, their floor level entry and the curvilinear building shape, echoing earlier traditions.

4.1(e) MIDDENS

Extensive midden areas are found at Boncuklu Höyük, in Areas M and H (and also in scrape Areas N and O, and section X). These large, open-air spaces are evidenced by the accumulation of organic material, *in situ* burning activity, small stone hearths and dense concentrations of animal bones and plant remains. Middens functioned as

communal food preparation, cooking, consumption and refuse areas, but also as spaces for craft production and other activities. Middens are dense in artefacts (wide ranging including at least two plaster vessels found in Area M midden), and phytolith surfaces attest to the use of reed matting in these spaces (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 223). Evidence for light, flimsy structures is also found in the midden areas-perhaps shelters for activities carried out in these spaces (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 223-24).

4.1(f) BURIALS

A total of c. 18 Neolithic burials have been recovered from Boncuklu as at the end of the 2013 season. Almost all (approximately 95%) were buried inside buildings. Burial in external areas is extremely rare and internal burials occur during the use-life of structures. Most are cut down into the plastered floors of the slightly raised, southeastern (clean) area (though for a small number of burials**,** it is uncertain whether they were cut into building floors or not (Baird Forthcoming; Baird, Fairbairn *et al.* 2012: 226; Baird pers. comm.). All burials are primary articulated, with intact crania (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 226; Baird pers. comm.). They are occasionally accompanied by grave goods; ranging from a few beads, to collections of lithic artefacts (Baird pers. comm.). Almost all Neolithic burials at Boncuklu are singular; the double burial in Building 4 is a rare and notable rare (Baird pers. comm.).

An interesting aspect of Boncuklu's burial practice is hinted at from evidence from the midden areas (Areas M and H). These comprise significant quantities of highly fragmented human skull pieces (Baird pres. comm.). Baird suggests these fragments represent the re-deposition of human skulls, thus are the remnants of distinct ritual activity involving the circulation of skulls outside of buildings, likely retrieved after primary burial (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 223; Baird pres. comm.). Other intriguing mortuary practices include the puppy burial in Area Q: a primary, articulated, adult male buried, articulated in an upright, crouched position, with at least 4 juvenile *canids* (Baird pers. comm.).

4.1(g) SUBSISTENCE

Boncuklu Höyük is a mixed forager farming community, hunting wild animals and farming domestic cereals and large seeded legumes. A range of Neolithic founder crops are present on-site including emmer wheat, free-threshing wheat, hulled barley and possibly einkorn. Large seeded legumes are also present (though it is currently unclear

whether or not these are morphologically domestic) (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 230). In addition to founder crops, the stones of hackberry, an edible fruit, are abundant (mirroring Çatalhöyük and Can Hasan III) along with terebinth nuts (*Pistacia* sp.) and wild almond (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 230; Fairbairn 2005; French 1972). Aside from plant foods, a diverse range of flora is evidenced including wetland grasses and many other wetland taxa (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 230). Analysis of plant remains retrieved from flotation, as well as micro morphology work and the examination of phytoliths recovered, attest to large quantities of reed plants on site. This is fitting considering its marshy location. Along with their possible use in construction and as bedding, reeds were likely used extensively for matting, to line the interior of buildings as well as work spaces in the open middens. The use of reeds in basketry is also likely, especially due to the lack of evidence for other storage facilities. (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 230; Baird pres. comm.). This interpretation is corroborated by use wear analysis of the many bone awls recovered from the site, the majority of which seem to have been utilised in basketry (Baird *et al.* Forthcoming; Baird pres. comm.).

Preliminary faunal analysis (Areas K, M and H only) suggests that like the flora, Boncuklu's animal species is also extremely diverse; dominated by hunted animals, with no evidence of domesticated species. High numbers of bird, fish and tortoise are present, along with a huge array of reptiles, mammals and birds from a range of environments: wetland, grassland and woodland (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 228-30). Mammals are dominated by wild cattle (*Bos primigenius*, NISP 102) and wild boar (*Sus scrofa*, NISP 97) though the huge size of the auroch demonstrates these were clearly the main meat element of the diet. *Equid* and *cervids* are also found, though in more modest numbers and again representing wild hunted animals. Sheep/goat are present only in extremely very small numbers (*Ovis/Capra,* NISP 9, *Ovis* sp., NISP 2 and *Capra* sp., NISP 2) (see Baird, Fairbairn *et al.* 2012: table 1 p. 229). This contrasts sharply to the pattern seen at neighbouring Çatalhöyük (see section 4.2) (Martin *et al.* 2002, Russell & Meece 2005).

4.1(h) FINDS, TRADE AND EXCHANGE NETWORKS

There is little evidence for the accumulation of material culture inside buildings; most finds come from the middens and open areas. Small geometric clay objects are the most abundant find at the site. Almost all the chipped stone is obsidian. Characterised by microliths and containing projectile points in the later levels, the chipped stone

assemblage is almost identical to that of 9th millennium cal. BC Pınarbaşı (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 231). Incised, decorated stones are common at the site (n=93; 32 of which also have a deep groove on the reverse side). These vary in style; some are purely decorative slabs or plaques, others also display a central groove running the length of one side (figure 4.1-7) (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 231). The grooved stones or shaft straighteners (n=63: 31 plain, 32 with additional, decorative incisions on the reverse side) are all very worn, with a highly polished groove suggesting their use in sharpening and straightening points for hunting. All incised stones are intricately decorated in a range of complex designs; both naturalistic and geometric (see figures 4.1-8 and 4.1-9). These highly symbolic items are found at sites across the Near East, including nearby 9th millennium BC Pınarbaşı where almost identical items with similar use wear are attested (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 195-6, fig 8 p. 213). They were likely part of hunting tool kits, and linked to individual identities.

Similarly symbolic, probable ritual items are hinted at in the presence of a small number of figurine fragments. No complete figurines have been found at Boncuklu Höyük, though two well-made near complete animal figurines, and two near complete female figurines in clay have been recovered, along with numerous fragments of animals and women (Baird pers. comm., see figures 4.1-10 and 4.1-11). Beads of marine shell and various stones are common, along with a smaller number of elaborately carved stone pendants. A range of ground stone tools are also present, again made from a variety of stones, which along with the beads and chipped stone, attest to wide-ranging exchange networks. Bone tools are also plentiful, most common in the form of awls (Baird *et al.* Forthcoming; Baird, Fairbairn *et al.* 2012: 231). As mentioned above, use wear analysis suggests that only a small proportion of these were used for piercing animal skins for clothing. The majority were utilised in working with reeds, likely in basketry making (Baird pres. comm.).

4.1(i) SUMMARY

The site of Boncuklu Höyük demonstrates a community of cultivators, farming both wild and domestic plants, and exploiting a wide range of hunted species. The repeated rebuilding of structures in the same place and to the same alignment, and the continuity evidenced in the internal organisation of space and the location of features, along with the use of decorative posts and the beginnings of wall and floor paintings and wall installations suggests the residents were development of strong household

identities, and domestic symbolic expression, closely related to the fixing of households to specific locations within the village. Many features typical of later Çatalhöyük seem to have their roots at Boncuklu Höyük, suggesting these villagers were the direct ancestors of Çatalhöyük, yet distinct variations are present also. This small, egalitarian community has strong symbolic expression as seen within buildings and on the numerous decorated stones and shaft straighteners (Chapter 3 figure 3.18). Ritual behaviour is evidenced in the red paint found on walls and floors, the presence of significant numbers of figurines, as well as the many post holes, which appear to be decorative rather than for support (interpreted as possible totem-like poles by the excavator). Boncuklu's economy is diverse, and though direct evidence for storage is lacking, the large proportion of reeds found on site, along with awls suggests agricultural and other food stuffs may have been collected and stored in baskets. Basketry could have a provided small to modest-scale storage capacity (as seen in the ethnographic example of large storage baskets, see figure 3.9). In addition, wide exchange links are attested by the range of raw materials present on site. In this context, a number of possible uses of the large number of small geometric objects found at Boncuklu Höyük can be imagined.

4.1(j) NEIGHBOURING PINARBAŞI

(i) Introduction

The site of Pınarbaşı is located 31 km southeast of Boncuklu Höyük (figure 4.1-1). One Late Epipalaeolithic and two Neolithic phases are found here; a 9th millennium BC Neolithic phase, and the second in the latter half of the 7th millennium BC. The dating and location of Pınarbaşı is significant; occupation overlaps settlement at both of the case study sites of Boncuklu and Çatalhöyük, thus Pınarbaşı can inform us about site interactions and activities in the landscape-warranting a brief overview of the site here (Baird 2012a: 183; Baird, Fairbairn *et al.* 2012: 231-32)

(ii) Environment

Pınarbaşı is located in a wetland environment, at the transition of the Konya plain into the limestone hills of the Bozdağ Mountains. It is represented by a series of rock shelters or caves, set into the cliff face-housing 7th millennium BC material (Area B) and a promontory projecting from the cliffs into the Hotamış Lake (recently dried up) and wetlands via a series of terraces. This promontory has yielded 9th millennium BC occupation material (Areas A, C and D) (see figures 4.1-12 and 4.1-13) (Baird 2012a: 183-84, 192; Watkins 1996).

(iii) Architecture & Features

The 9th millennium site is contemporary to the earlier phases at Boncuklu (represented by Area K, Baird, Fairbairn *et al.* 2012: 224). Its environmental setting is similar to that of Boncuklu, and the two sites share a number of similarities. Buildings at Pınarbaşı are oval or at least apsidal or curvilinear. They are semi-subterranean with super structures of wattle and daub; mostly recognised as plaster lined cuts. They have little elaboration (Baird 2012a: 193). Many of 9th millennium Pınarbaşı's buildings show repeated re-plastering events, and contain features including hearths, plaster basins, pits and stone seats or work surfaces (Baird 2012a: 193-94). The structures attest to significant site investment and a long-term use of the site in either regular visits or permanent use of the buildings (Baird 2012a: 193-94, 197). A small 9th millennium BC cemetery in Area A supports this notion, though its presence contrasts to the burial practices seen at Boncuklu (Baird 2012a: 194). Open areas of site are also seen; like the middens at Boncuklu, they display with evidence of cooking pits and food refuse (Baird 2012a: 194).

(iv) Other Evidence

Similarity to Boncuklu is also seen in the microlith dominated chipped stone assemblage of Pınarbaşı, which mirrors that of Boncuklu with 80% obsidian (Baird 2012a: 194-95). This along with the presence of sea shells attests to wide-ranging exchange contacts (Baird 2012a: 197). Sedinterising behaviour is seen at 9th millennium BC Pınarbaşı in the presence of multi-seasonal fauna and increased site investment in space (Baird 2012a: 197). Baird suggests this community "represents decedents of mobile Epi-Palaeolithic groups exploiting the Konya Plain such as those represented in the rock shelter excavation" at Pınarbaşı (Baird 2012a: 196-97). Like Boncuklu, wild auroch and equid dominate the fauna. Likewise, fishing and fowling is seen, though limited (Baird 2012a: 196). Plant exploitation and processing is present here, yet all plants are nuts, and there is no einkorn or emmer in either wild or cultivated form (Baird 2012a: 195, 196, 197). 9th millennium Pınarbaşı may represent the seasonal occupation of the two sites (Boncuklu Höyük and Pınarbaşı) by the same community-with inter site variability explained as representing differing seasonal adaptations and being related to length of stay. Alternatively the two sites may be different, independent communities, or thirdly, the nature of the two sites may be a diverse combination of scenarios 1 and 2 above (Baird 2012a: 232).

ILLUSTRATIONS

FIGURES:

Figure 4.1-1: View of Boncuklu Höyük, looking south. (Photograph: author's own).

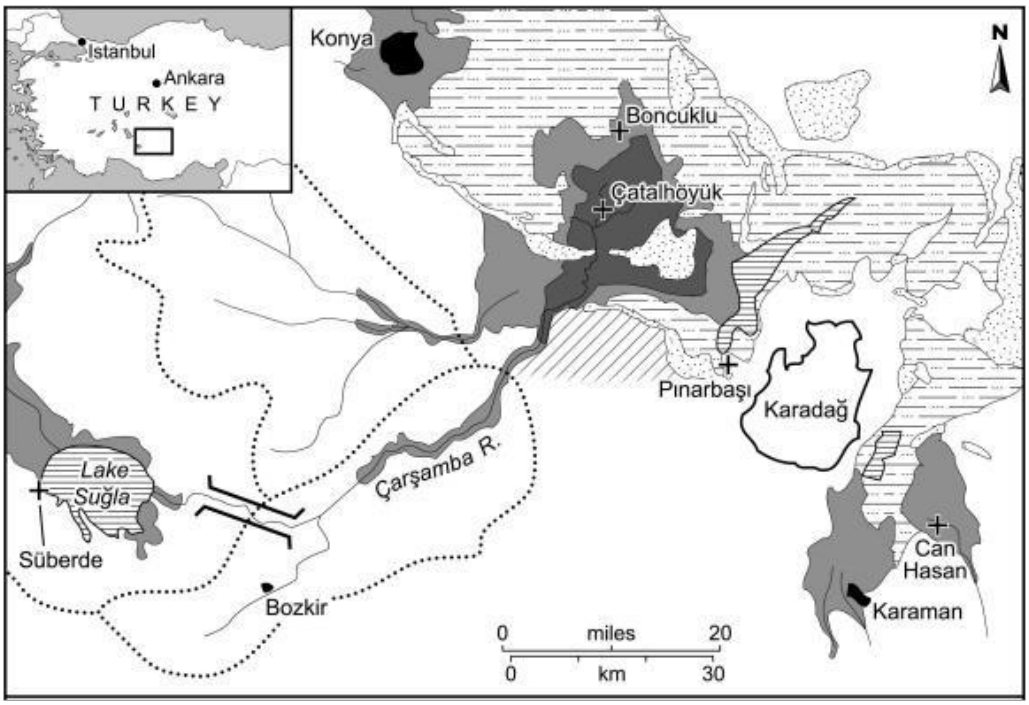


Figure 4.1-2: Map of the Konya plain, Central Turkey, displaying the main sites discussed (map courtesy of the Boncuklu Höyük Project).

Figure 4.1-3: Plan of Boncuklu Höyük with the main excavation and "scrape" areas marked (Baird *et. al.* 2012: fig. 1 p. 239).

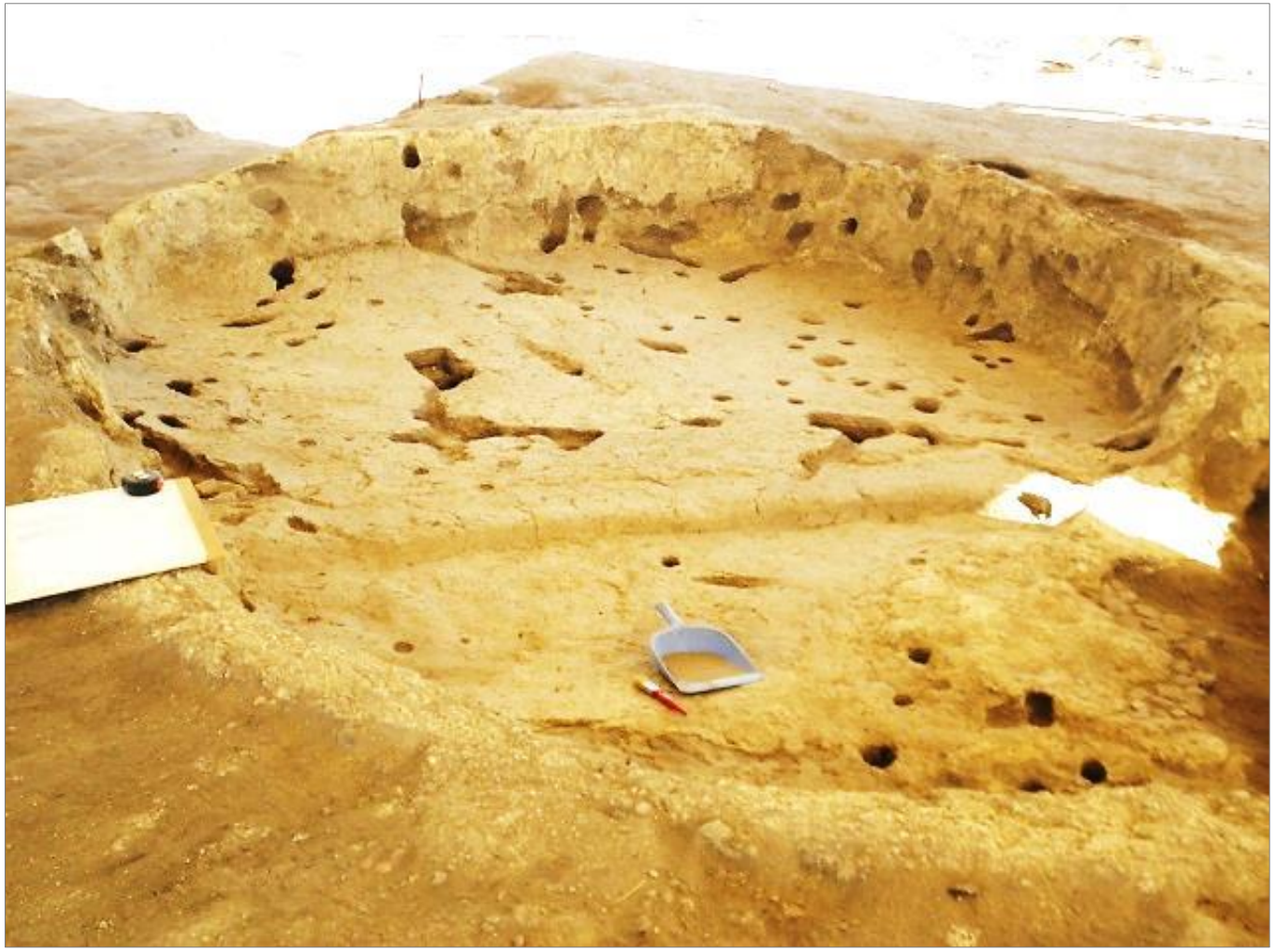


Figure 4.1-4: Typical building at Boncuklu Höyük: plaster lined mudbrick walls with plaster floor. The two different sections of the building can be seen by the ridge sunning across the width of the building (this example is Building 6, Area N). (Photograph: author's own).

Figure 4.1-5: Cross weave matting found extensively at Boncuklu Höyük. (Baird *et. al.* 2012: fig. 9 p. 242).

Figure 4.1-6: Plaster installation: north wall, Building 1.2, Area M. (Baird *et. al.* 2012: fig. 10 p. 242).

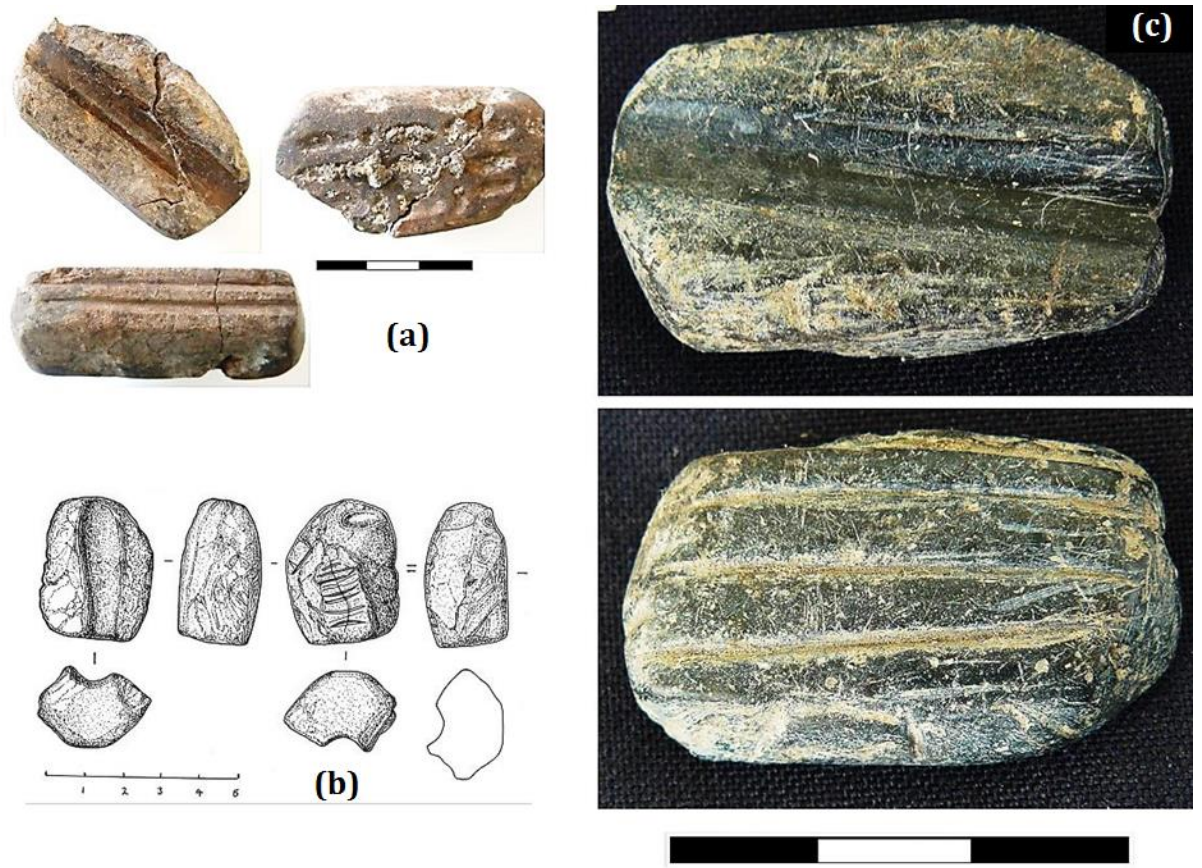


Figure 4.1-7: Grooved stones or "shaft straightener" from Boncuklu Höyük; decorative incisions on the upper surface, Single, deep groove on the reverse. **(a)** SF# 61-BK06, **(b)** SF# 1656-BK12 and **(c)** SF# 237-BK07. (Photographs: Christine Schepens, drawings: Caroline Hebron. Courtesy of the Boncuklu Höyük Project).

Figure 4.1-8: Decorated and incised stone with groove or "shaft straightener". From Boncuklu Höyük. (Baird *et. al.* 2012: fig. 13 p. 244).

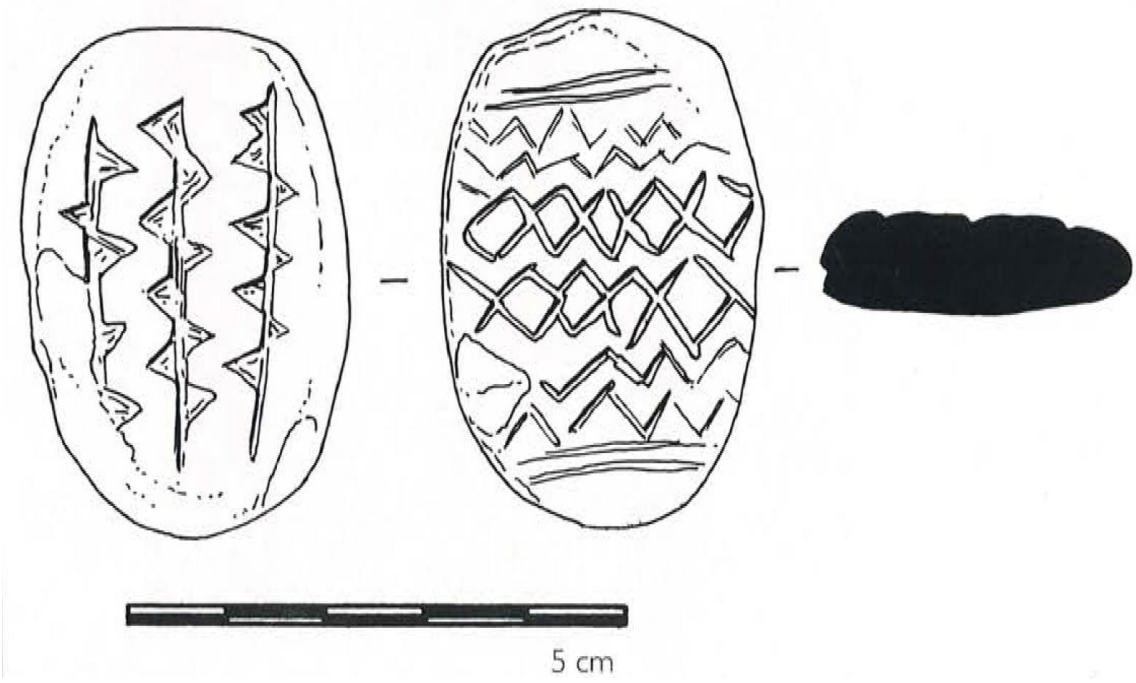


Figure 4.1-9: Stone with incised decoration. From Boncuklu Höyük (Baird *et. al.* 2012: fig. 15 p. 243).

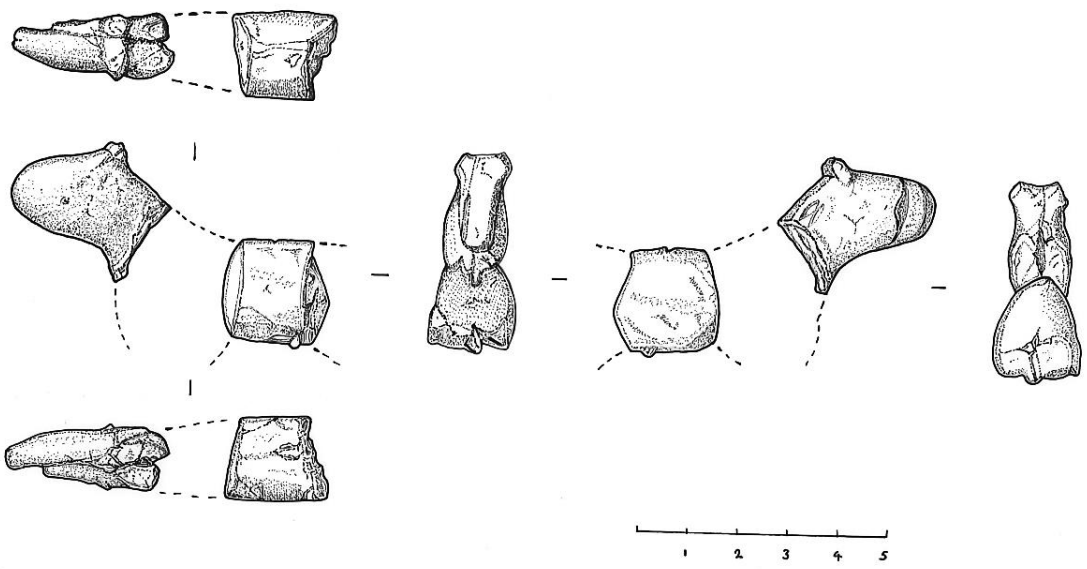


Figure 4.1-10: Zoomorphic figurine in clay; possibly a sheep (SF1584-BK11), from Boncuklu Höyük. (Drawing: Caroline Hebron, courtesy of the Boncuklu Höyük Project).

Figure 4.1-11: Female figurine in clay from Boncuklu Höyük (BK13). (Photograph: Christine Schepens, courtesy of the Boncuklu Höyük Project).

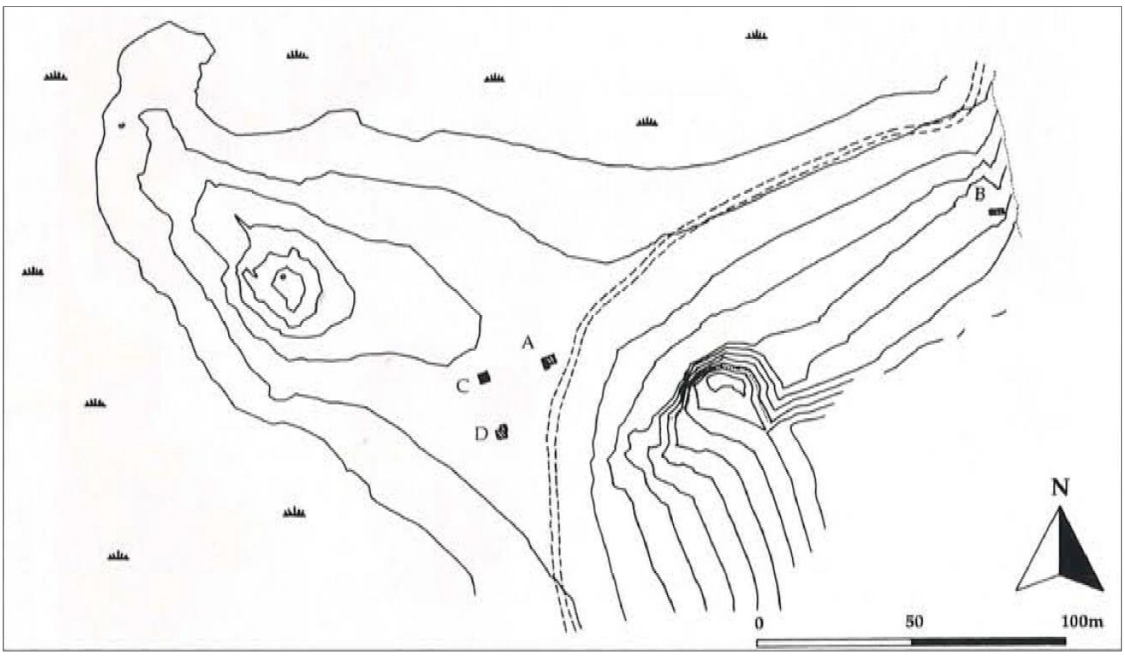


Figure 4.1-12: Contour plan of Pınarbaşı detailing the mound and cliff side cave sites (Baird 2012a: fig 2 p. 210).

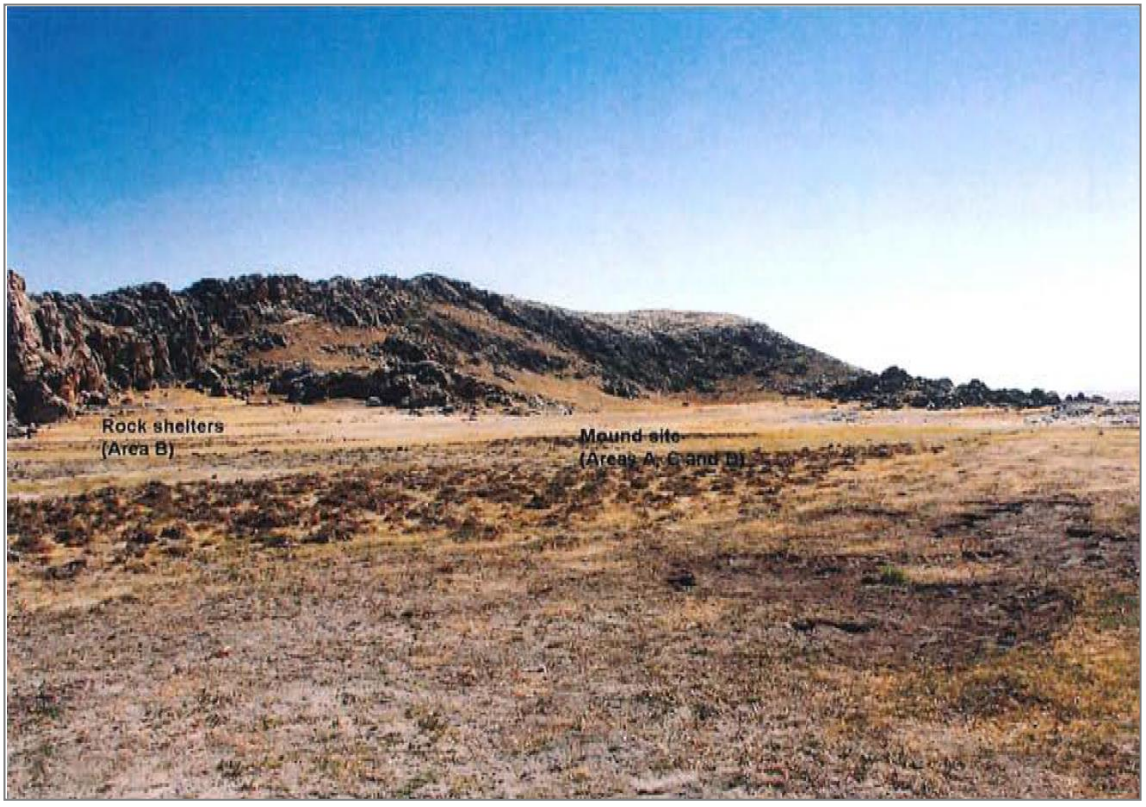


Figure 4.1-13: View of Pınarbaşı detailing the cliff set rock shelters and mound site (Baird 2012a: fig 3 p. 210).

CHAPTER 4.2: ÇATALHÖYÜK SITE OVERVIEW

4.2(a) DISCOVERY, LOCATION & EXCAVATIONS

The Neolithic site of Çatalhöyük is arguably the most well-known and important Neolithic site in Turkey, if not the Near East. Renowned for its large size, density of settlement, excellent preservation of buildings, and houses full of symbolic expression including wall paintings and installations; this large farming community has been the subject of archaeological research for many decades. Its significance was underpinned in July 2012 by the awarding of World Heritage Status as a UNCECO a site of "outstanding universal value" (UNESCO 2012). Çatalhöyük was identified in 1958 by British archaeologist James Mellaart and excavated by his team from 1961-1965 (Mellaart 1978, Mellaart 1975, Mellaart 1967, Mellaart 1966, Mellaart 1965a, Mellaart 1965b, Mellaart 1964a, Mellaart 1964b, Mellaart 1963, Mellaart 1962). Since 1993, excavations have been carried out by an international team led by Ian Hodder, then of Cambridge University and now of Stanford University (Hodder 2014a, Hodder 2014b, Hodder 2013a, Hodder 2013b, Hodder 2010a, Hodder 2007, Hodder 2006, Hodder 2005a, Hodder 2005b, Hodder 2005c, Hodder 2005d, Hodder 2005e, Hodder 2004, Hodder 2002, Hodder 2001, Hodder 2000, Hodder 1999a, Hodder 1999b, Hodder 1998, Hodder 1997, Hodder 1996a, Hodder 1996b, Hodder 1995, Tringham & Stevanovic 2012). Located in the Konya plain, Çatalhöyük lies in close proximity to other Neolithic sites (Boncuklu Höyük, Pınarbaşı, Can Hasan) as well as Neolithic sites in the Lake District and Cappadocia (such as, Suberde, Erbaba, Musular and Aşıklı Höyük; figures 4.2-1 and 4.1).

Çatalhöyük consists of two mounds, East and West. The main, "East Mound" is oval shaped, measuring 450 m by 275 m (13.5 hectares) and stands high above the Konya Plain, making it clearly visible from a distance (figure 4.2-3). The main focus of excavations is on this East Mound settlement, as it has over ten levels of continuous occupation spanning over one thousand two hundred years. Settlement at Çatalhöyük began on the East Mound, commencing in the mid-8th millennium BC. It continued into the latter half of the 7th millennium BC before moving to the much smaller "West Mound" (c. 6,200 cal. BC) where Late Neolithic and Chalcolithic occupation (from c. 6,000 cal. BC) continues for a further 1,000 years The focus of this section is the East Mound, where the core of the Neolithic settlement lies. As such, "Çatalhöyük" will be used henceforth to refer to the East Mound alone, unless otherwise stated.

4.2(b) CHRONOLOGY & EXCAVATION AREAS

(i) Excavation Areas

Çatalhöyük West Mound has been excavated in a number of different areas (trenches are named numerically, see figure 4.2-2). Excavation on the East Mound has been far more extensive. This tell was the location of Mellaart's work in the 1960's, which was focused in the "South Area", in an area to the southeast of the tell's summit (see figure 4.2-2). Excavation in Mellaart's South Area has continued under the current, where a deep sounding has revealed the entire sequence of occupation at the site (figure 4.2-4). This and the North Area (previously called Area 4040) are the two main excavation areas of the current Hodder project. Extensive excavation also covers other parts of the East mound, with smaller areas named after the teams carrying out research: BACH (Berkley Archaeologists at Çatalhöyük), TP (Team Poznan) and IST (Istanbul University Area, figure 4.2-2).

Due to the duration and scale of excavation, along with a thorough retrieval process (involving flotation and sieving) and finds policy (to store all artefact, possible artefacts and structural materials recovered), many thousands of clay artefacts and other finds have been recovered from Çatalhöyük over the many excavation seasons. One hundred percent of excavated deposit at Çatalhöyük is sieved or floted. All excavated deposits are sampled for either flotation or wet sieving (a single 30 litre sample from each excavated unit, where available is taken). All other sediment is dry sieved on the tell (Bogaard *et al.* 2012: 177; Hodder & Cessford 2004: 24). Like at Boncuklu Höyük, the heavy residue (non-floating material resulting from the location process) is sorted into 4 size categories (ranging from greater than 4mm to less than 1mm) and processed by hand (Hodder & Cessford 2004: 24).

(ii) Chronology

The East Mound at Çatalhöyük has continuous occupation spanning around one thousand two hundred years from the mid-8th to late 7th millennium cal. BC (c. 7,400-6,200 BC); covering the Levantine Late PPNB into the Ceramic Neolithic (Hodder, Cessford & Farid 2006: 20-21; Cessford 2005a: 77, fig. 4.3 p. 76). Due to the size of the mound, and the various excavation areas, the chronological relationship between them is not entirely clear; thus each of the main areas (South, North, TP) has its own set of levels, and chronological systems. As excavations in the South area are the most extensive both in depth and area, this has been the focus of chronological reconstruction-providing a full sequence from virgin soil to the end of the Neolithic.

Though at the time of writing, the chronological sequence was undergoing extensive revisions (Bayliss 2014).

(iii) Mellaart System

Mellaart divided settlement at Çatalhöyük (South Area) into twelve building levels, referenced by Roman numerals from XII (oldest) to (the youngest) I (table 4.2-1). Fourteen radio carbon dates placed levels II to X to between c. 6,500-5,700 BC (table 4.2-1). Subsequent work by Hodder developed this system identifying additional levels; four pre-XII phases named A to D (pre-XII D-oldest, pre-XII A-immediately precedes level XII) and level 0 as the youngest phase (table 4.2-2). It is now clear occupation at Çatalhöyük began with level pre-XII D c. 7,400 cal. BC, ending sometime between 6,200-5,900 cal. BC, with a few hundred years of simultaneous activity on the East and West Mounds (Hodder, Cessford & Farid 2006: 20-21; Cessford 2005a: 77, fig. 4.3 p. 76).

The terracing of settlement makes the reconstruction of contemporary phases very difficult. In recent years, Ian Hodder has attempted to revise the chronology, introducing his own "Hodder" phase system; as opposed to "Mellaart" levels (Hodder 2014a, table 4.2-3). Unique to each excavation area, this system aims to be more accurate, as well as proposing chronological links across excavation areas. As the new Hodder phase system is incomplete at present, and all publications refer to the Mellaart levels, for ease of understanding and comparison of characteristics, unless discussing specific excavation levels more recently excavated (Chapter 6), Mellaart levels will be referred to within the discussion section of this chapter. The entire sequence at the site can be divided into two broad phases; "Earlier Neolithic" representing pre-Mellaart level VI and the "Later Neolithic" post-Mellaart level VI (with many broad differences in various aspects of material cultures seen across these two phases) (Düring 2007: 155).

4.2(c) ARCHITECTURE & LAYOUT

(i) Village Layout

At 13.5 hectares, Çatalhöyük is one of the largest Neolithic settlements in the Near East. What is immediately striking is the density of settlement, with houses tightly compacted, sitting side by side with abutting walls or only small alleyways separating them, in stark contrast to Çatalhöyük's predecessor Boncuklu Höyük, and contemporary 7th millennium BC Pınarbaşı (figure 4.2-5a). There were no streets as we know of them today, but rather flat roofs with roof access into buildings by use of ladders. There are no "courtyards" as Mellaart suggested. The small open spaces

between buildings were middens: distinct deposits for the dumping of refuse, dense in faunal and botanical remains, as well as being rich in finds. Çatalhöyük's village plan is strikingly homogenous; all buildings are of a similar size, internal layout and features. The extensive excavation means it can be claimed with a large degree of certainty that there are no corporate buildings here, as seen at other Neolithic sites, nor distinct functional areas such as an industrial zone. The unmistakable homogeneity of settlement was remarked on by Mellaart who, due to the large size of the settlement, reasonably thought the workshops and public buildings must lie outside of the small area he had excavated at that time (though he did claim "Shrines" were present along with "houses" – see discussion below).

(ii) Size and Population

Çatalhöyük, though considerably large at 13.5 hectares, is not alone in the Neolithic Near East. A handful of other sites are as large, if not larger than Çatalhöyük including Abu Hureyra 2, 'Ain Ghazal, Basta and Wadi Shu'eib to name but a few (see Chapter 3.5) (Cessford 2005b: 323). The size of the settlement taken along with the density of occupation, contemporaneity of occupation across the span of the site and lack of open spaces has led to the suggestion that Çatalhöyük was the largest agglomeration of people in the Neolithic Near East. Estimating the size of any population is difficult. Mellaart proposed the population was 8,000 to 10,000 (1965b: 202); later revising this to 5,000 to 7,000 people (1979: 25). More recently, Cessford suggests a number anywhere between 3,500 and 8,000 is plausible (though admitting it is impossible to produce a "definitive or precise" estimate) (2005b: 326). It is difficult to explain such a large population agglomeration; why would so many people chose to live together in such a dense settlement, with houses abutting each other? The Konya Plain Survey has revealed that the Aceramic Neolithic saw a number of sedentary sites; however at the time of the initial growth of Çatalhöyük East, all other sedentary communities were disappearing (Baird 2002: 150). This suggests that Çatalhöyük was the result of the coming together of numerous small communities. After a few hundred years, nearby sedentary communities no longer existed, though it is possible that they were so small and low density, they continued, yet left no archaeological trace (Baird 2002: 148, 149, 150; Baird 1996).

(iii) Buildings

A striking feature of the architecture at Çatalhöyük is the remarkable uniformity across many variables: alignment, size, internal layout and construction. All buildings were

constructed of sun-dried mudbrick and mortar, and up to six courses of these regularly formed bricks were used as foundations (figure 4.2-7) (Mellaart 1967: 55). Building foundations were placed on top of middens or animal pens if possible, though most often they were built directly upon the foundations of older buildings, and to the same alignment (Hodder 2006: 119). All buildings are rectangular, with no windows or doors to the outside due to the close proximity of each building to one another-with abutting exterior walls (Hodder 2006: 101-02, 107; Mellaart 1967: 67). Roofs were flat, constructed of wooden beams sealed with mud and reeds (Mellaart 1967: 56). Access was obtained via a hole in the roof, with a ladder descending down into the space from the flat roof (Hodder 2006, Mellaart 1967: 56). The walls are approximately 0.40 m thick (although this does vary) and the interior floor space averages 20 m^2 (Hodder 2006: 107; Düring 2005: 167). As such, in terms of appearance, the buildings at Çatalhöyük are remarkably similar to those of 8th millennium BC Aşıklı Höyük, where rectangular mudbrick buildings, built close together and with roof access via a ladder are also attested (figure 4.2-8).

Çatalhöyük's buildings were usually built on top of older buildings and to the same alignment, plan and internal use of space and decoration (figure 4.2-5b) (Hodder 2006: 107, Düring 2005: 161). They consist of a main room, along with one or more, smaller rooms or storage annexes. Internal space is divided by interior walls (also of mudbrick) and wooden posts which tend to be found in the main room only (figure 4.2-9) (Hodder 2006: 107). Many of the openings between rooms are mere crawl holes, with the small side rooms only accessible via the hands and knees (Hodder 2006: 101-02). A huge amount of time and resources was invested in buildings: walls and floors of beaten earth were plastered and re-plastered constantly, and walls were frequently maintained and rebuilt (Hodder 2006: 110). Most walls display 50 to 100 distinct plaster layers internally, though some have up to 450 layers of plaster (measuring up to 7.5 cm thick) remaining (Hodder 2006: 107, 110, 119; Mellaart 1967: 49, 50). It used to be thought that this plastering was undertaken on a yearly basis, thus buildings were interpreted as being lived in for 50 to 100 years before being collapsed and rebuilt. More recent work shows multiple re-plastering events within a single phase, thus reducing the life span of house occupation (Hodder 2006: 107, 110, 119; Mellaart 1967: 49, 50).

Aside from construction, size and shape, the interior features and layout of Çatalhöyük's buildings also show remarkable continuity (Hodder 2006: 119-22, 151).

No "furniture" is found, however floors were covered in matting, and built-in installations are found in all buildings (Hodder 2006: 101-02; Mellaart 1967: 218). Raised rectangular platforms acted as sleeping, sitting and working benches, these were covered in matting (Mellaart 1967: 60). All buildings had an oven on the north wall, above which a ladder provided access to the outside (Hodder 2006: 107). This north area was for "dirty" work including cooking and craft production. The roof space also acted as a working area, whilst the south of buildings was for sleeping, and remained clean, free of cooking and craft manufacture refuse (figure 4.2-10). A significant storage capacity is attested inside buildings, with baskets, hanging bundles, storage bins, basins and annexes/side rooms common place (figure 4.2-11) (Atalay & Hastorf 2006: 299-302; Mellaart 1967: 210; Hodder 2006: 155-56). Analysis of seeds and their distributions shows the inhabitants of Çatalhöyük gathered, processed and stored seeds for later seed use as an integral part of subsistence practices (Fairbairn *et al.* 2007). Almost all buildings contain elaborate decoration including wall paintings, niches, decorative "tiles" (figure 4.2-12), benches decorated with horns and plastered reliefs (figure 4.2-13 and later in this chapter) (Hodder 2006: 101-32; Mellaart 1967: 77-177). The dead were buried under platforms within the house, in the south, southeast and southwest areas.

As seen above, all aspects of architecture are highly structured at Çatalhöyük with remarkable continuity attested in the construction, layout, interior use of space, abandonment and demolition practices (Hodder 2006: 119-22, 151). This continuity suggests a highly symbolic function of the house, which continued into the abandonment phase (Hodder 2006: 124-25). At the end of their life, buildings' walls were knocked down, in-filling the building and forming the perfect base onto which to place the foundations for a new building (Hodder 2006: 124-25). The act of in-filling of houses upon the end of their use-life has been interpreted as a ritual act, marking the death of the house. Although the buildings at Boncuklu Höyük are different in construction, size and shape, the continuity in the use of space, along with the presence of some similar features, such as the use of paint, presence of installations and a continuity in the interior use of space suggest many of the strong, symbolic practices attested at Çatalhöyük saw their origins in the earlier, smaller communities of the Konya Plain.

The homogeneity seen in building size, internal features, the location and range of activities, as well as the lack of public buildings or larger, distinctive buildings with

different kinds of activities attested inside them all suggests an egalitarian society (Hodder 2006: 90). There are no buildings which can be marked out due to their richness in any aspect (Mellaart did claim for the presence of shrines, though this idea is now largely refuted, see later in this chapter). The egalitarian nature of the village is reflected in the mortuary evidence (see later in this chapter), as well as research into the diet and health of the residents, household accumulation and various aspects pf status differentiation (Hodder 2006: 90, 163; Mellaart 1967: 66, 69, 77-130; Molleson, Andrews & Boz 2005; Richards & Pearson 2005).

4.2(d) SUBSISTENCE

(i) Fauna

The villagers of Çatalhöyük exploited a wide range of animals and plants, both wild and domestic. The faunal record is dominated by mammals: with sheep and goat the most abundant species in all 12 occupational levels, constituting between 55-80% of the fauna (table 4.2-4) (Atalay & Hastorf 2006: 290; Martin, Russell & Carruthers 2002: 198, fig. 3; Russell & Martin 2005: fig. 2.1 p. 42). Sheep are fewer than goat and both are represented mainly as domesticated species (Martin, Russell & Carruthers 2002: 199-200). Pig/boar is present, though in very small proportions in all 12 levels (Russell & Martin 2005: fig. 2.1 p. 42, 62). Wild hunted species are few, yet include *equid* (European wild ass, onagar and horse) and deer (red, fallow and roe) (Martin, Russell & Carruthers 2002: 198, fig. 3; Russell & Martin 2005: 57, 60). Cattle is also present in far fewer proportions. In most levels cattle appear to be wild, hunted species reflecting their highly symbolic role at the site (see further on in this chapter) (Martin, Russell & Carruthers 2002: 201; Russell & Martin 2005: 46-61). Bird bone is rare at Çatalhöyük, especially in comparison to mammal remains (Russell & McGowan 2005: 99). In all levels, the majority of specimens are wetland types (ducks and geese), though the exact species varies from level to level (Russell & McGowan 2005: 101, figs. 3.1 & 3.2). The presence of cranes and raptors may have held a more symbolic role, and it has been proposed that their feathers and other body parts were used to form costumes worn as part of ritual performance (Mellaart 1966: 189 for the painting in Shrine F.V.1; Russell & McGowan 2005: 110).

(ii) Flora

Plant foods are wide ranging, covering both cultivated and gathered plant foods; though cultivated species dominate (figure 4.2-14). The main domesticate grasses and legumes are all present, including emmer, glume wheat, einkorn and free threshing

wheat (Atalay & Hastorf 2006: 89). Wild and domestic barley are also present, though less common than wheat and declining in presence over the duration of settlement (Asouti & Fairbairn 2002: tbl. 1 p. 183; Atalay & Hastorf 2006: 89; Fairbairn 2005: tbl. 1 p. 199). Rye is found in very small quantities, and lentil, pea (both domestic), bitter vetch, chick pea and grass pea are also attested (Asouti & Fairbairn 2002: tbl. 1 p. 183; Atalay & Hastorf 2006: 289-90; Fairbairn 2005: tbl. 1 p. 199). Seeds, fruits and nuts in the form of wild mustard, acorn, pistachio, almond, terebinth, cherry, sumac, juniper and hackberry are also numerous (see table 4.2-5 and figure 4.2-15) (Asouti & Fairbairn 2002: tbl. 2 p. 184; Atalay & Hastorf 2006: 90; Fairbairn 2005: tbl. 1 p. 199).

4.2(e) SYMBOLISM & RITUAL

Portable artefacts as well as wall paintings installations and reliefs inside houses, and burial practices all attest to strong symbolic behaviours at Çatalhöyük (as already seen in Chapter 3 figures 3.14 and 3.19). The significant amount of "religious" items and imagery frequently found in Çatalhöyük's buildings led Mellaart to designate 40 of the 139 "living rooms" he excavated as "shrines": that is, "a unique sequence of sanctuaries… decorated with wall-paintings, reliefs in plaster, animal heads, stylized bucrania and containing cult statues" (table 5.3-6) (Mellaart 1967: 77). Mellaart's notion of "shrines" is now generally refuted, as the buildings are not so distinct, but built to the same plan and with the same construction techniques as ordinary houses. Inside they contain the same built-in components: platforms, benches, hearths and ovens. Furthermore, almost all buildings at Çatalhöyük have elaborate decoration and under floor burials (see discussion below).

Despite the lack of support for the existence of shrines at Çatalhöyük, there certainly is a great deal of evidence for ritual in almost every building. Ritual and symbolic practice appears to have played a central role in the lives of the residents. As detailed above, paintings covered the walls of Çatalhöyük's houses; these were re-plastered and re-painted on a regular basis, including colourful geometric and naturalistic designs covering a range of themes. Common representations include hands, geometric patterns of triangles, diamonds and lines (figure 4.2-16. Also see Chapter 4 figure 4.14), hunting scenes, vultures, leopards, boars and other wild animals (Czeszewska 2014; Mellaart 1967: 131-77). Notably men are the only humans depicted in these scenes, clearly identifiable by the presence of beards and other male indicators. The animals depicted are all wild, with violent scenes of men challenging these wild animals with spears, bows and arrows. Men are also seen headless, as in the vulture scenes (figure

4.2-17 and figure 4.14 Chapter 4). Notably, animals depicted in wall paintings are not the species reflected in Çatalhöyük's faunal record. This strongly suggests the paintings had a deep symbolic significance, reminiscent of earlier times where men fought with wild beasts on a daily basis for survival, unlike the sedentary village site where the main subsistence was farming domestic animals and crops.

Plaster wall reliefs are another enigmatic feature of many Çatalhöyük buildings, being found in most occupation levels. They appear in both sunk and raised relief, and are especially typical of the buildings Mellaart interpreted as "shrines" (see table 5.3-6). A common image is that of a figure, with raised arms and legs, and a protruding stomach (Chapter 3, figure 3.19). Mellaart claimed this represented a pregnant "Mother Goddess", yet the head, feet and hands were always missing so this interpretation was always questionable (Hodder 2005: 20-21). Recent finds of objects depicting creatures in the same pose (such as the stamp seal, figure 4.2-18b), with clearly recognisable paws and claws, now make it clear these reliefs represent bears, not goddesses, thus helping to discredit Mellaart's shrine theory. Unlike wall paintings, which were abundant, plaster wall reliefs and installations are not as common. Other depictions include facing leopards and bull's heads in the form of bucrania (see figure 4.2-19 and figure 4.2-13. Also see figure 3.19: Chapter 3). Houses were dismantled at the end of their use. Yet before this, installations such as bucrania, animal skulls and horns, and reliefs were carefully removed, again pointing to their symbolic significance.

(i) Burials, History houses and Ancestors

The longevity of occupation, as well as the rebuilding of houses on the sample place, to the same alignment and with the same internal arrangement of space and features all attests to the importance of the house as a marker of identity and history. Houses were memorialised as living remnants of the past. The burial of people inside houses; under the floors or platforms of the main room, which then continued to act as work, rest and sleeping spaces, attests to the close connection between the living and their memorialised ancestors (Hodder 2010b: 22-26; Hodder & Meskell 2010: 49-65; Hodder & Pels 2010: 163-85). A range of burial types were practiced, including primary inhumations, double inhumations, secondary burials, and disturbed burials of multiple occupants. Çatalhöyük's burials are very well preserved, with traces of wood, matting and textiles in some. Highly crafted burial goods accompany a small number of examples. In addition, a number of skeletons show signs of decapitation which echoes the depiction of headless men in the vulture scenes found on wall paintings. Again, the

human remains and burial practices at Çatalhöyük have been studied extensively (most recently by Boz & Hager 2013; Hillson *et al.* 2013; Spencer Larsen *et al.* 2013; Nakamura & Meskell 2013).

The number of burials is enigmatic. Firstly, the number of burials per building varies dramatically, from zero, up to 50 or more. Certain houses are favoured, and so cannot represent burials of house occupants. Also, with just 462 burials recovered over 253 buildings (from the 1960's excavations onwards) there are far too few burials (1.8 burials per household) and so alternative burial locations must have been utilised (Andrews, Molleson & Boz 2005: 267-273, i.e. skeleton 1466 fig 11.6 p. 268, skeleton 4593 fig 11.9 p. 269; Düring 2003: 8; Hodder 2006: 198-202; Hodder & Meskell 2011; Hodder & Pels 2010; Mellaart 1967: 205-07, tbl. 13 p. 81; Meskell 2008; Richards & Pearson 2005).

(ii) Figurines

Mellaart claimed the female figurines were symbols of the great "Mother-Goddess" the main deity of the settlement (figure 4.2-20) (Mellaart 1967: 179-85, 202-03; Voigt 2000: 253), although it is now clear that there is little solid evidence for this (Hamilton 2005b: 208). The Mother Goddess idea has been adopted by various groups, interpreting Çatalhöyük as a settlement where females held power and influence over men. It is certainly true female figurines outnumber those of men (figures 4.2-21 and Chapter 3 figures 3.15 & 3.16), however, it also appears to be significant that gender is associated with specific mediums, with all of the humans represented on wall paintings (in hunting scenes or in association with wild animals)are all male. The recent excavations have also yielded many more anthropomorphic, zoomorphic and abbreviated forms (Meskell *et al.* 2008: 139, figs. 1 & 2, tbl. 1). These have been studied in great detail (Hamilton 2005b; Meskell & Nakamura 2013; Meskell *et al.* 2008; Nakamura 2012). Figurines are likely to have been used in ritual, possibly in narrative play or performance. These activities likely took place outside, explaining the higher proportion and density of figurines in these locations as compared to inside buildings (Meskell *et al.* 2008: 151, tbl. 3 p. 152-53).

4.2(f) CRAFTS, EXCHANGE & RESOURCE PROCUREMENT

(i) Overview

The artefacts recovered from Çatalhöyük attest to the high degree of skill of the residents. Highly crafted items are present at site, in a range of forms and raw

materials; attesting to wide ranging exchange contacts across the Near East (Mellaart 1967: 210-20, Hodder 2006: 153-68). A wide range of groundstone items, used in cooking and food processing are present (Mellaart 1967, Baysal & Wright 2005, Wright 2013, Wright & Baysal 2012). Pottery, wooden vessels and containers, incised grooved stones, clay and stone figurines, baked clay and stone stamps, utilitarian tools of obsidian and flint, along with polished, decorative bone (figure 4.2-22), obsidian and flint items such as mirrors and daggers (figure 4.2-23) have all been found (Carter & Milic 2013; Carter, Connolly & Spasojevic 2005; Last 2012; Last 2005; Mellaart 1967: 210, 213, 216-17, pls. XIV, 114, 121, 105-108, 99-102, 82, 109-112; Türkcan 2005; Yalman, Tarkan & Gültekin 2013). Bone tools and decorative items are also common, in the form of polishers, pins, awls, cups, scoops, ladles and belt hooks (Mellaart 1967: 214-15; Russell & Griffiths 2013). Other decorative items include beads, which are present in a number of styles, made from bone, clay and a variety of stones and shells (Hamilton 2005a; Mellaart 1967: 217, pls. 81, 103, 104, XV; Wright 2012).

The stamps seals from Çatalhöyük are interesting as unlike contemporary and later sites, no impression of any stamp, either in clay or plaster has been found (figure 4.2-18); leading to the suggestion these items were not used as stamp seals (as seen at Tell Sabi Abyad, and commonly at many other late 7th and 6th millennium BC sites in the Near East. See Chapter 3 sections 3.3, 3.6 & 3.7, Chapter 4.3 and figures 3.10 & 4.3-13). Instead, they were more likely used to stamp their intricate geometric design onto fabrics, leathers, walls and perhaps human skin (see for example, the female figurine with painted/decorated skin-Chapter 3 figure 3.16a) (Cassidy 2008: 208; Türkcan 2013; Türkcan 2005). Stamps may have also had a ritual or magical function-acting as identity markers in a similar way to incised grooved stones of the Neolithic (see Chapter 3 figure 3.18). “Clay balls” are present in large numbers at Çatalhöyük; in both the “mini” (n=1,254 approx.) and large forms. The latter are interpreted as cooking balls – used as an indirect heat source in the boiling of liquid foods in waterproofed baskets or skins (Atalay 2013;, Atalay 2012; Atalay & Hastorf 2006: 306. 308-09, fig. 8 p. 308, tbl. 5 p. 306; Atalay 2005; Atalay 2001). In addition, a large number of the small geometric clay objects (or “tokens”) are spherical in shape, comparable to the small (“mini”) clay balls) (Bennison-Chapman 2013, Atalay 2013, Atalay 2005).

The level of preservation at Çatalhöyük is excellent, with wooden containers (figure 4.2-24) preserved in many instances (Mellaart 1967: 105-08). There is a great deal of evidence for basketry, matting and clothing. The presence of matting and basketry is

manifest in phytoliths and impressions in clay and plaster, as well as a small number of surviving actual examples. All show a tabby weave, as seen at Boncuklu Höyük (Rosen 2005: 206-07; Mellaart 1967: 60, 218;, Wendrich 2005). Similarly, textile working and weaving is indicated by the numerous depictions of people in various types of clothing as seen on wall paintings (i.e. Mellaart 1965b: pls. 59-64, XI, XIII). Clothing is also depicted on figurines (for example Mellaart 1967: pls. X & 79, figs. 5 & 51), and textile, identified as flax also survives in a few instances (figure 4.2-25) (Mellaart 1967: 218, 116-118, pl. 94; Farid 2008; Ryder 1965). It seems likely leather was also produced, used for clothing as well as pouches and bags.

(ii) Raw Materials

The residents of Çatalhöyük exploited a wide range of local and imported raw materials. Bone and clay were obtained from both on-site and the immediate surrounds (Suponic 1999: 102-03; Doherty 2013). Woods of various species are present, both from the Konya Plain and further afield including juniper, oak and fir (Mellaart 1967: 212, 215; Asouti 2005: 215-18, tbl. 10.1 p. 217). Stones present include basalt, diorite, flint, granite, calcite and alabaster mainly used to make beads (Mellaart 1967: 212, 214). Freshwater and sea shells are attested, common species include dentailium, cowrie, whelks and cardium (Bar-Yosef Mayer *et al.* 2013). Marine shells come from the entire Turkish Mediterranean south coast from Hatay in the east, all the way to the start of the Aegean Sea region on the southwest corner of Turkey. Fresh water shells come from lakes, streams and rivers; from both local water sources and also from those in the Taurus Mountain range (Bar-Yosef Mayer 2013; Gümüş & Bar-Yosef Mayer 2013; Mellaart 1967: 212). With such abundant evidence of storage, as well as an advanced subsistence economy, it can be imagined that grain, nuts, seeds and other items were exchanged for the imported materials found on site (Atalay & Hastorf 2006: 299-302; Mellaart 1967: 210; Hodder 2006: 155-56).

4.2(g) SUMMARY & CONTEXTUAL DISCUSSION

The large population agglomeration in dense, seemingly overcrowded conditions (by today's standards), with a complex mixed farmer forager economy, an abundance of imported and local raw materials, and sheer range of craft items in circulation, compounded by the diverse nature of ritual evidence-all attest to a highly developed society. A society in which small geometric objects could be imagined operating in a variety of spheres. With a diverse and complex society at Çatalhöyük, many people are surprised by the lack of evidence of social differentiation, and the absence of corporate

buildings and the zoning of particular areas for specific tasks. However there are of course inequalities which could have been stark, yet invisible archaeology; various forms of immaterial wealth for example. There is also an apparent lack of evidence of conflict at the site, suggesting the inhabitants lived in equality and harmony, and continued to do so upon their migration to the West Mound at the end of the 7th millennium cal. BC.

(i) Boncuklu Höyük & 7th Millennium Pınarbaşı

As discussed in Chapter 4.1, Çatalhöyük's earliest levels are contemporary to the latest phases at neighbouring Boncuklu Höyük, with Boncuklu's earliest phases (Area K) predating Çatalhöyük by several hundred years (Baird *et al.* 2012: 221, 232). The two sites share a number of similarities, and many features which characterise Çatalhöyük manifest themselves at the earlier site; however there are also stark differences. The 7th millennium BC settlement at Pınarbaşı, spanning the last 500 years of the millennia, is contemporary to the later settlement phase at Çatalhöyük (Mellaart levels V-0. Baird 2012a: 200; Cessford 2005a: 97). In nature, 7th millennium Pınarbası is very different, represented by a southwest facing rock shelter in Area B (where earlier Epipalaeolithic settlement is also attested. Chapter 4.1, figures 4.1-12 and 4.1-13) (Baird 2012a: 199-200). In strong contrast to Çatalhöyük, structures here are light, consisting of a walled enclosure in the early phase, and a reed structures in the latter (Baird 2012a: 200). Intense, repeated occupation and abandonment is evidenced in 7th millennium Pınarbaşı's the latter phases and subsistence shows hunted equid and auroch along with domestic sheep dominate. However plant foods are rare, with very little cultivated cereals and legumes found on site, in strong contrast to Çatalhöyük (Baird 2012a: 200-201). Plant processing tools are also extremely rare (only one example was identified) despite a groundstone source only 5 kilometres away, suggesting 7th millennium BC Pınarbaşı was a camp site utilised by hunter-herders roaming the surrounding hills of the Bozdağ and the Konya Plain (Baird 2012a: 184, 200-201). The evidence does not make clear who these people were, however in terms of lithic composition (90% obsidian) and symbolic and ritual items found on site, many similarities to Çatalhöyük are attested (Baird 2012a: 201-02; Connolly 1999: 18). This may be used to suggest the seasonal visitors at 7th millennium Pınarbaşı were "task groups" sent out from Çatalhöyük, Can Hasan I or both (Baird 2012a: 203). Yet the group(s) using Pınarbaşı may equally have been mobile herder-hunters crossing the wider landscape, and interacting with Çatalhöyük, Can Hasan I and other contemporary settled sites (Baird 2012a: 203).

ILLUSTRATIONS

FIGURES:

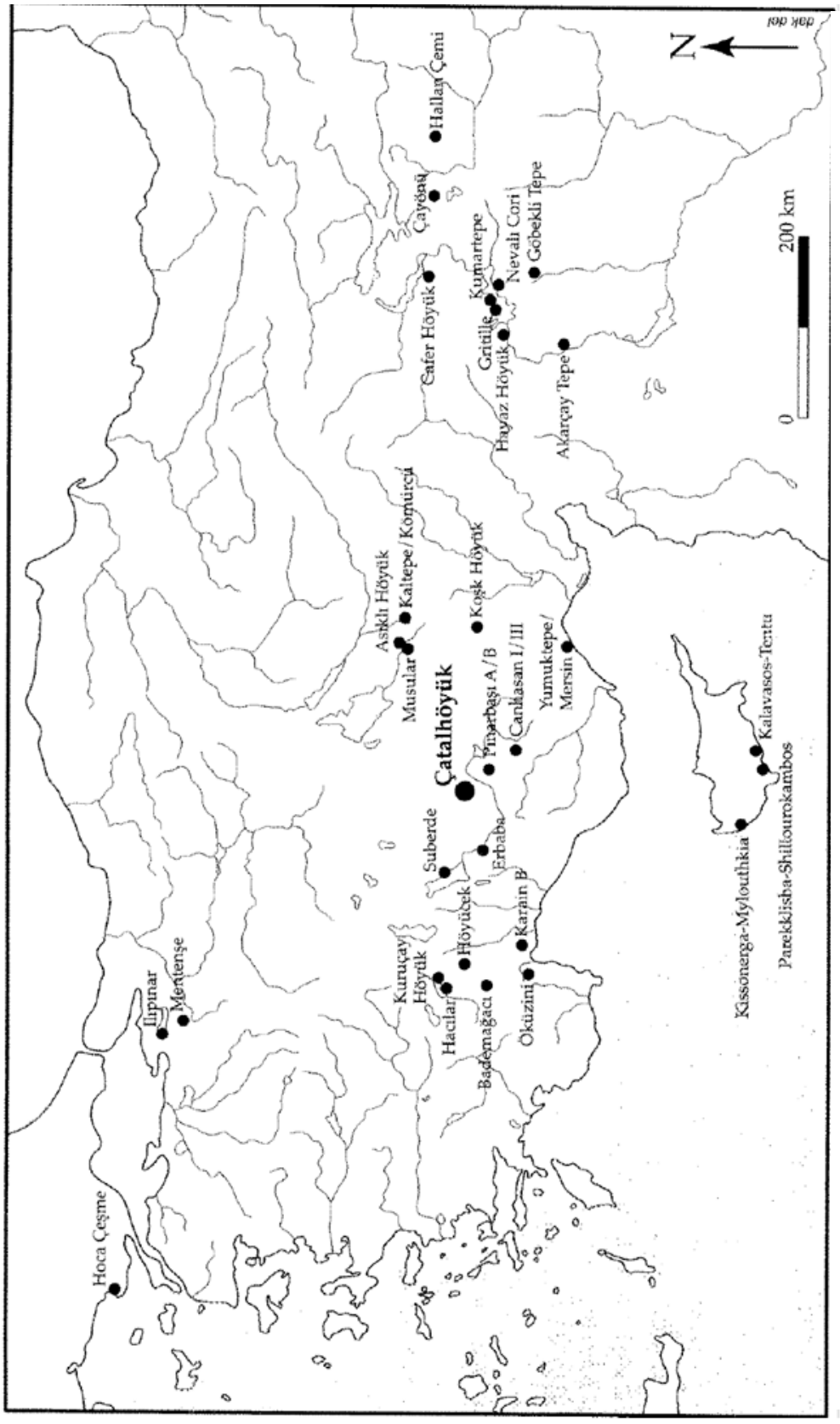
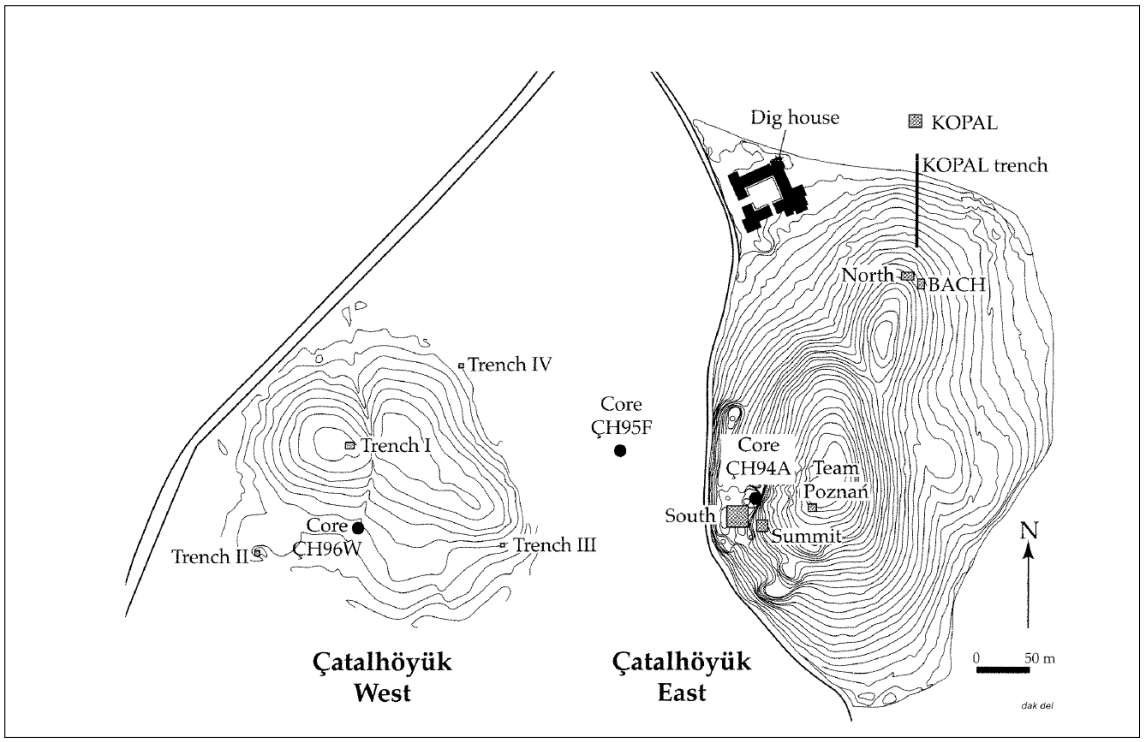
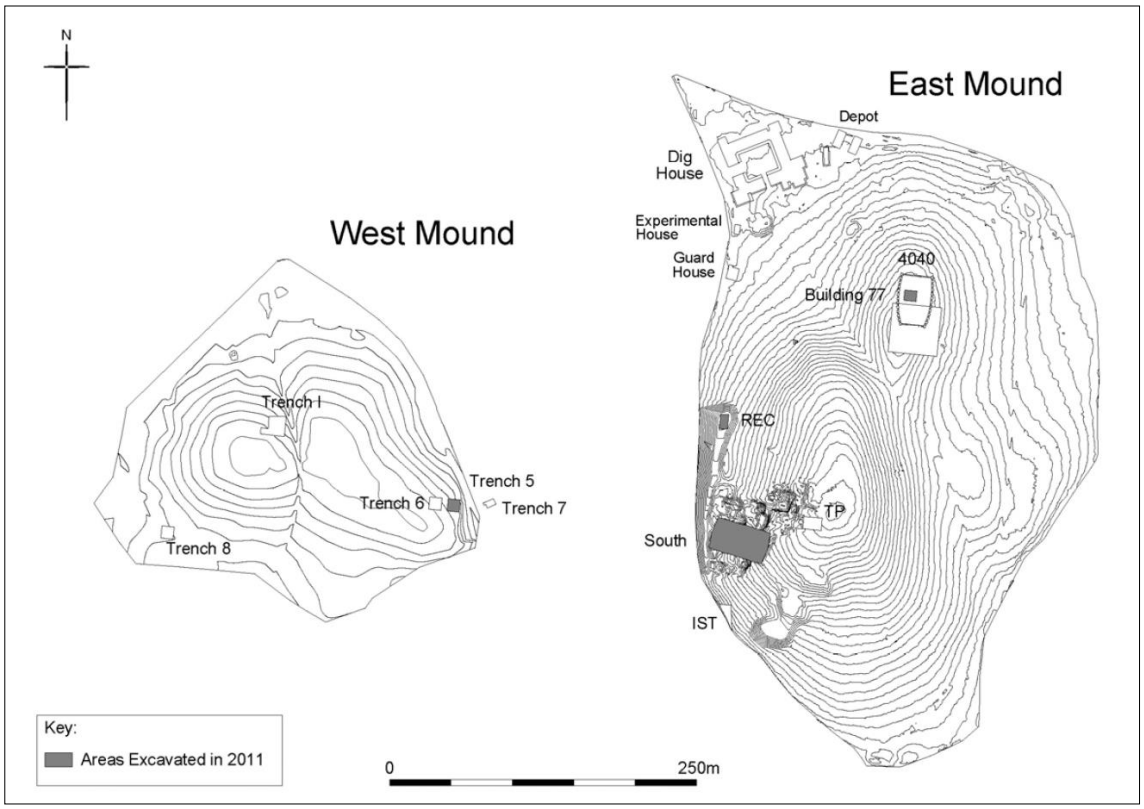


Figure 4.2-1: Map of Çatalhöyük's position in Central Anatolia, with contemporary sites marked (Hodder, Cessford & Farid 2006: fig. 1.1 p. 4).



(a)



(b)

Figure 4.2-2: Plan of Çatalhöyük East and West mound with excavation areas **(a)** as at the start of Ian Hodder's project in the early 1990's marked (Hodder, Cessford & Faird 2006: fig. 1.2 p. 5). **(b)** Excavation areas as at 2011 (Doherty 2011: fig. 15 p. 11).

Figure 4.2-3: View of Çatalhöyük East mound. (Photograph: author's own).

Figure 4.2-4: View of the South Area excavations (taken in 2010) showing the scale of work undertaken in this area (Mellaart and Hodder teams). The deep sounding can be seen in the centre under the wooden beams. (Photograph: author's own).

Figure 4.2-5: (a) Ground plan of excavated areas of level VIB showing the density of settlement, uniform size and layout of buildings (Adapted from Cutting 2005: 154). **(b)** Building I, showing continuity of the use of space across the 8 phases of use (Hodder 1999b: fig. 2 p. 132).

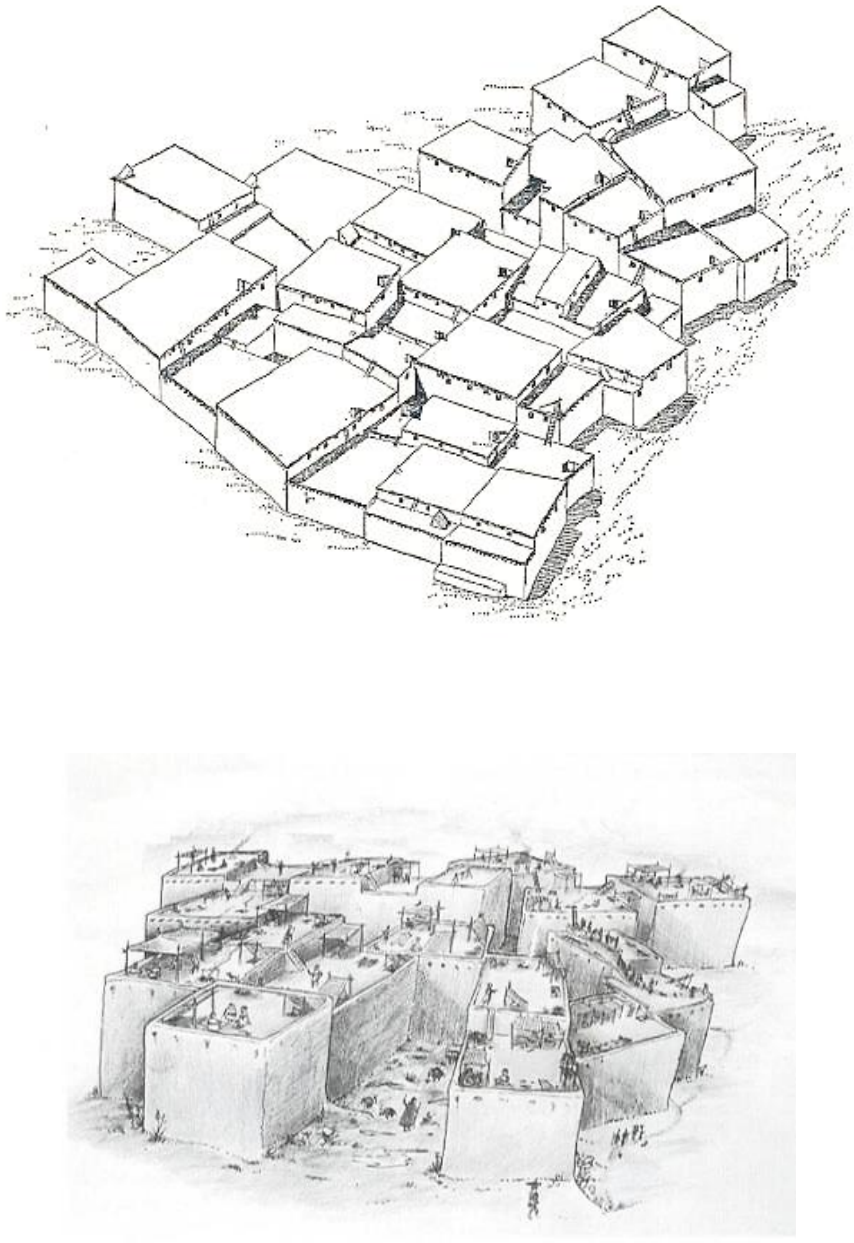


Figure 4.2-6: Reconstructions of the settlement at Çatalhöyük East; showing the high density of settlement and roof access. **(Top)** Mellaart reconstruction (Mellaart 1967: fig 12 p. 62). **(Bottom)** reconstruction of Çatalhöyük "town" by John Swogger (Hodder 2006: fig. 4.6 p. 88).

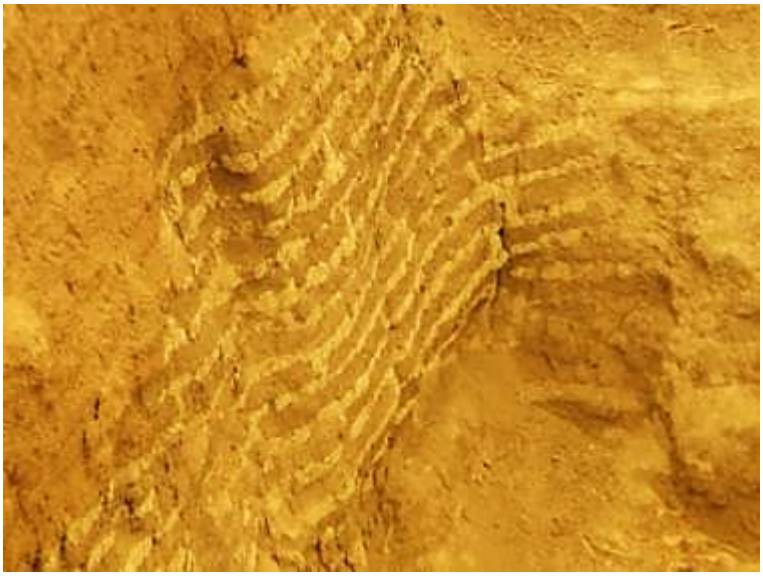


Figure 4.2-7: Mud-brick building wall at Çatalhöyük (Photograph: author's own).

Figure 4.2-8: Roof tops of the reconstructed buildings from the 8th millennium BC cal. village at Aşıklı Höyük, Cappadocia. The buildings here are similar to those at Çatalhöyük in terms of size, construction, streets on the roofs with roof access via ladders into buildings. (Photograph: author's own).

Figure 4.2-9: Building 77 under excavation (2010 season, taken from the south), showing the shape, size and interior layout and elaboration of a typical Çatalhöyük building. (Photograph: author's own).

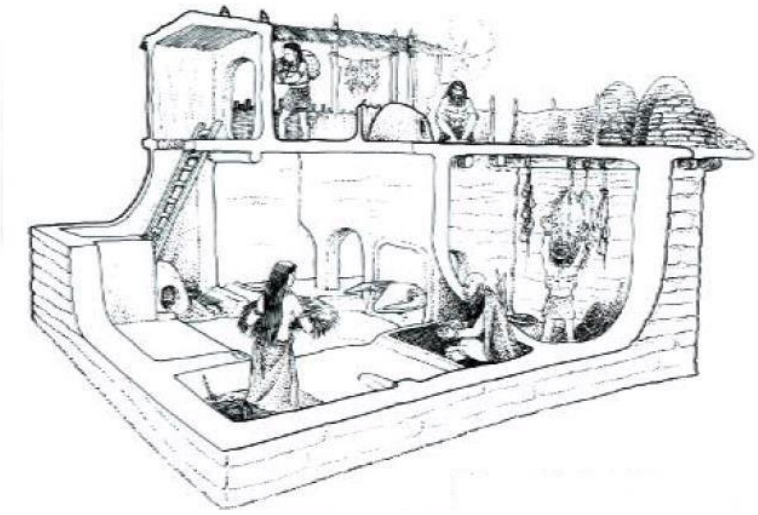


Figure 4.2-10: Reconstruction of a Çatalhöyük house showing the interior layout and use of space, both inside and out (Building I. Hodder 2006: fig. 5.8 p. 106).

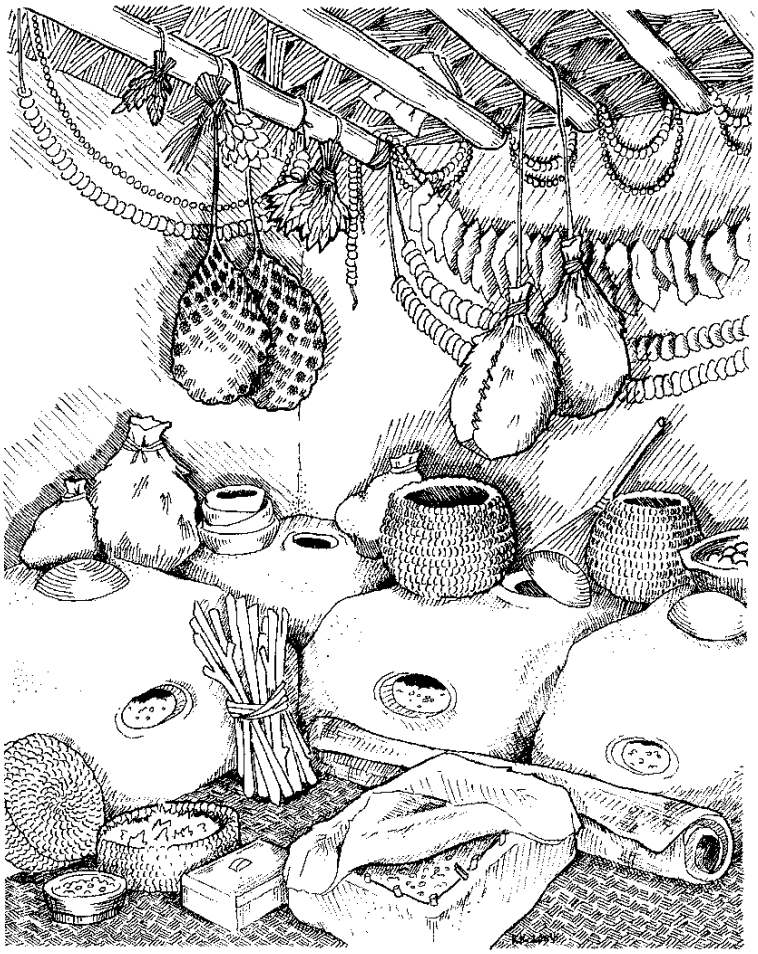


Figure 4.2-11: Household storage facilities: hanging bundles, baskets, leather bags and clay/mud silos (Atalay & Hastorf 2006: fig. 6 p. 292).

Figure 4.2-12: Internal elaboration of structures. **(Top left)** panel style painting from the wall of a building in North Area. **(Top right)** distinctive decorative painted tile, from the north wall of Building 77, North Area/4040. **(Bottom)** decorated niche, Building 77. (Photographs: author's own).

Figure 4.2-13: **(Left)** bucrania installation. North East corner of Building 77, North Area. **(Right)** moulded plaster feature from the east wall of the same building. (Photographs: author's own).

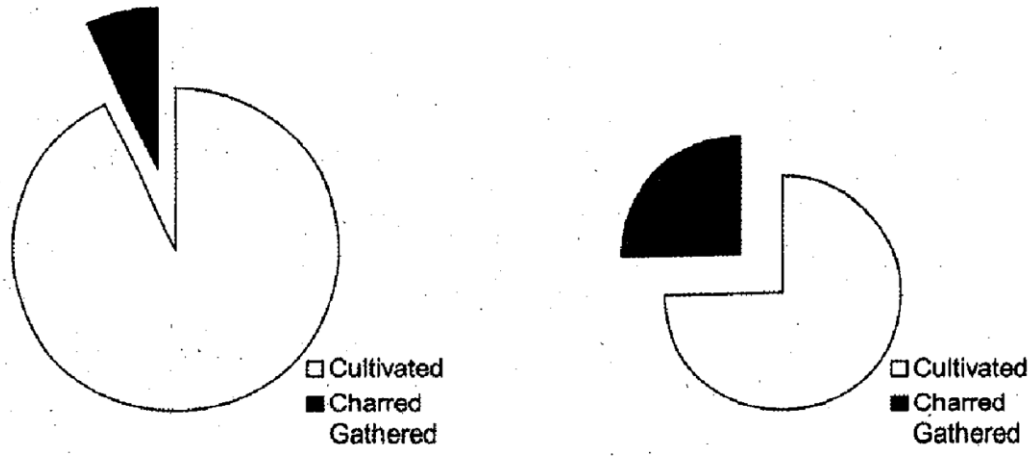


Figure 4.2-14: Comparison of cultivated (cereals and pluses) vs. gathered (nuts and fruits) plant foods at Çatalhöyük East: **Left:** based on the proportion of charred plant remains and **right:** calorific conversion of the charred remains. (Asouti & Fairbairn 2002: fig. 4 p. 187).

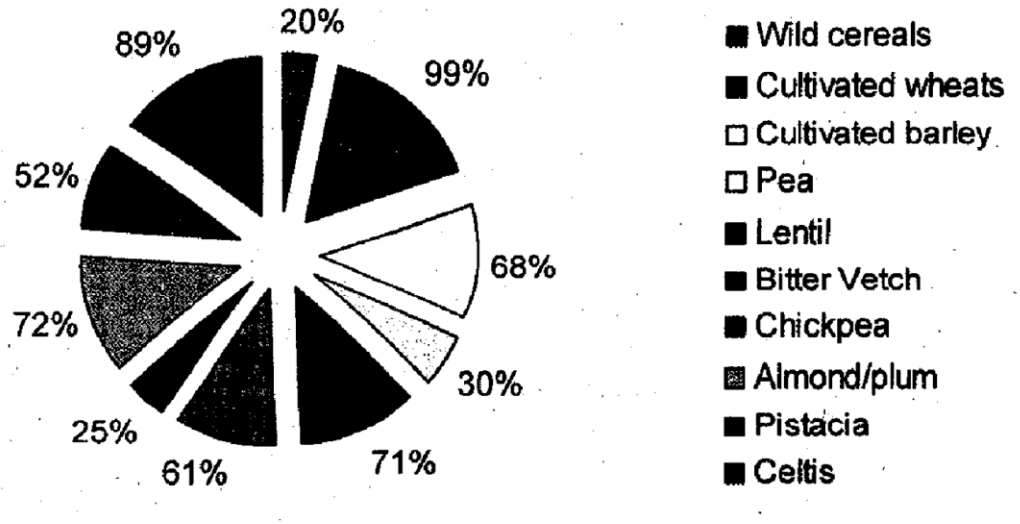


Figure 4.2-15: Chart illustrating the relative proportions of the major edible plants at Çatalhöyük East. (Asouti & Fairbairn 2002: fig. 3 p. 187).

Figure 4.2-16: Selection of wall paintings showing geometric designs and handprints. All from recent excavations at Çatalhöyük (South Area). (Photographs: author's own).

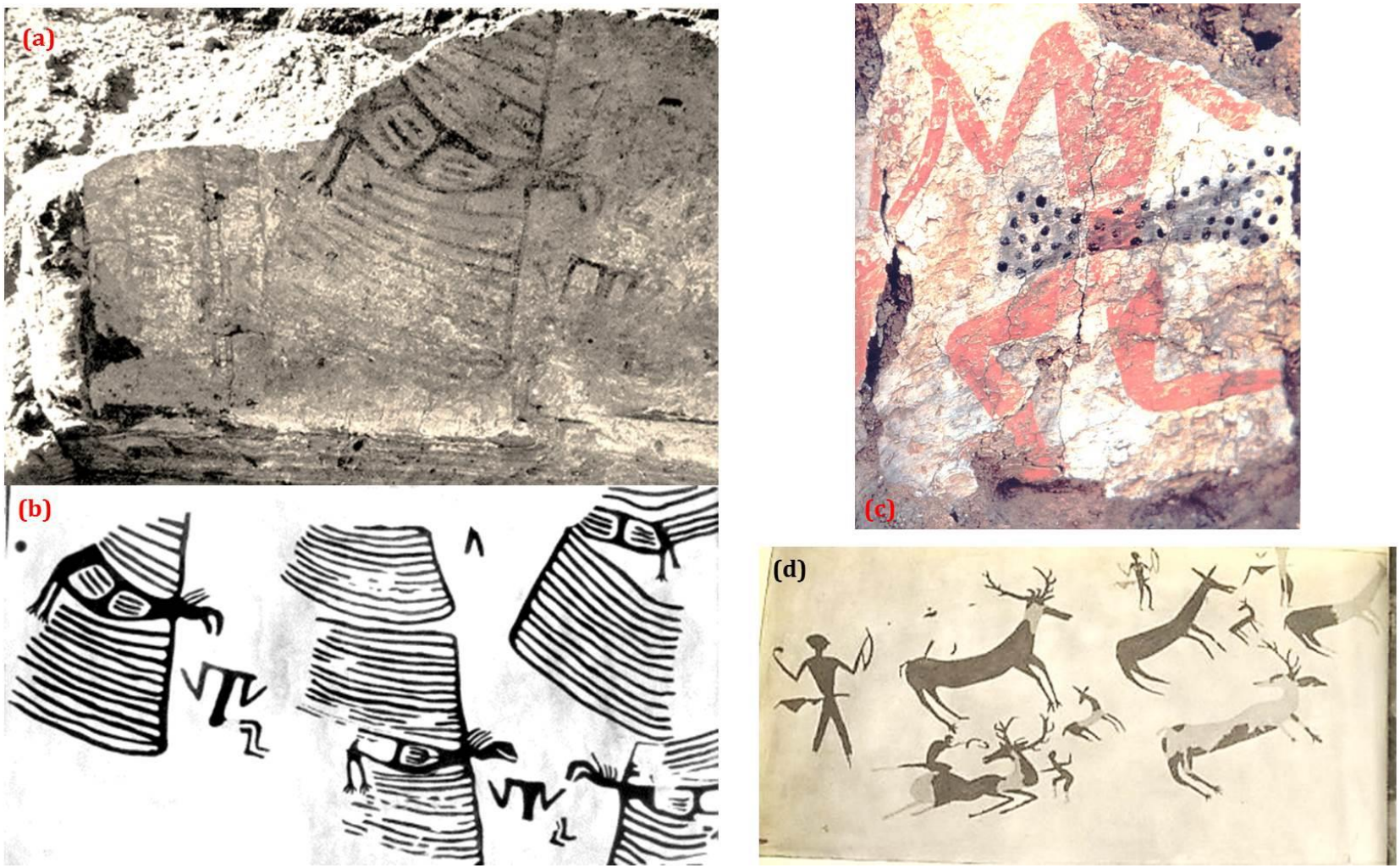
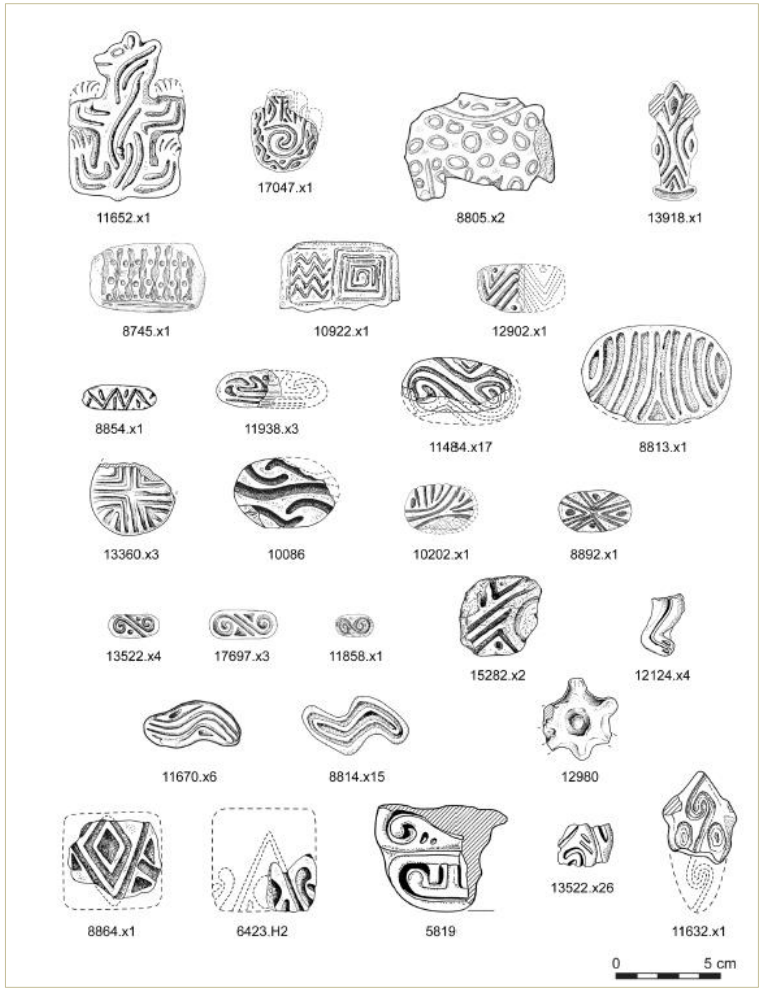


Figure 4.2-17: Selection of wall paintings from Mellaart's 1960's excavations from Çatalhöyük (South Area). **(a)** & **(b)** Vultures decapitating humans (Neolithic painting and modern copy, **(c)** detail of men hunting and **(d)** modern copy of the deer hunt scene (Mellaart 1967: Pls 48-9, pl. XIII, p. 54).



(a)

(b)

Figure 4.2-18: (a) Range of stamp seals from Çatalhöyük. **(b)** Detail of the stamp seal in the form of a bear: no. 11652.x1, in a similar pose to a popular style of installation at Çatalhöyük (see Chapter 3 figure 3.18). (Hodder 2013b: back cover, Türkcan 2013: 239).

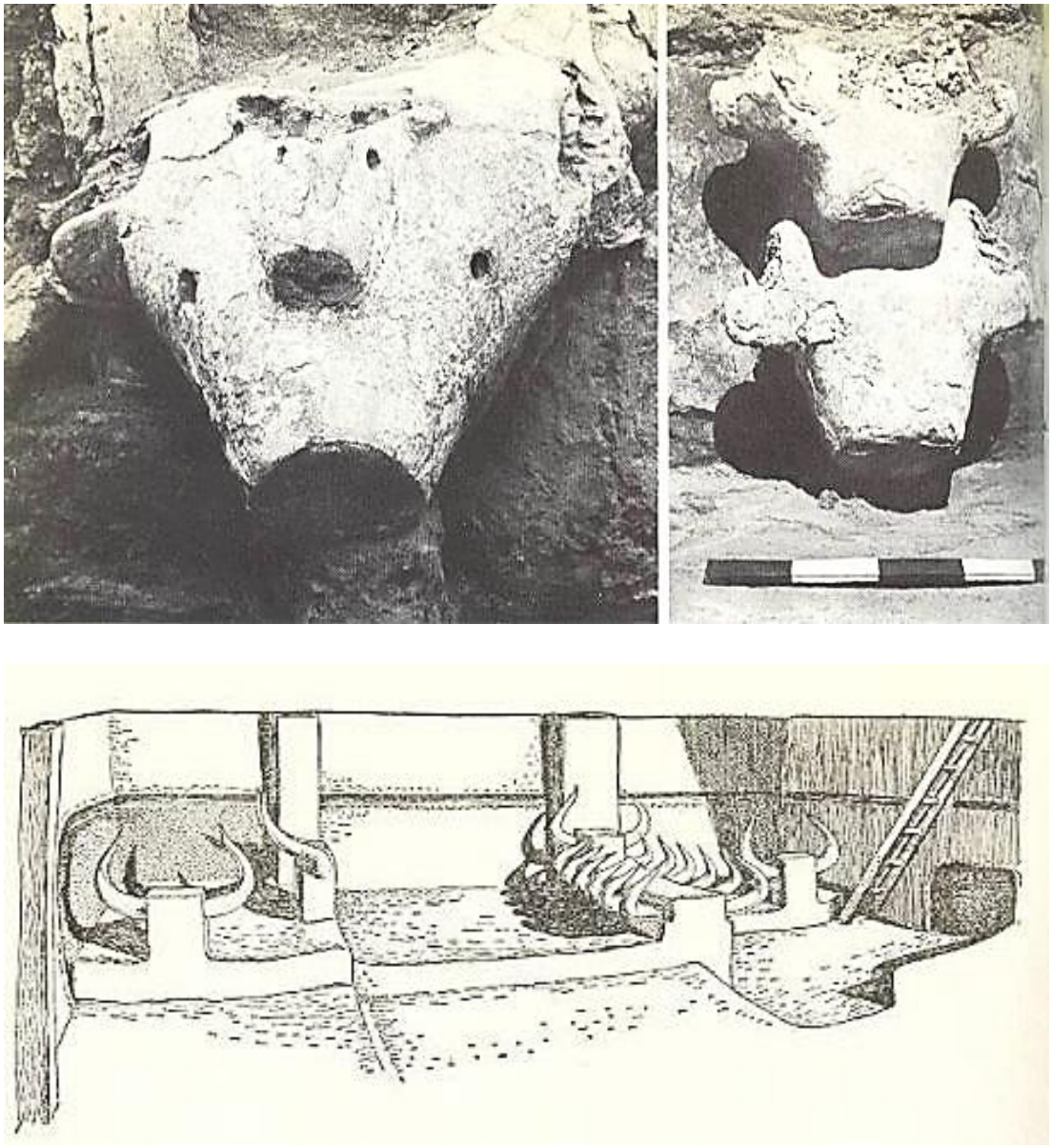


Figure 4.2-19: Installations inside houses at Çatalhöyük. **(Top)** Plastered bull's heads adorning a wall (Mellaart 1967: pl. 22). **(Bottom)** East and south walls of "shrine" VI.6, with bucrania and rows of horn cores set into a bench (Mellaart 1967: 118).

Figure 4.2-20: The famous seated female figurine from Çatalhöyük; initially interpreted as a representation of the 'Mother Goddess'. Front and reverse Excavated by Mellaart, 1960's. (Mellaart 1967: pls 67-68).

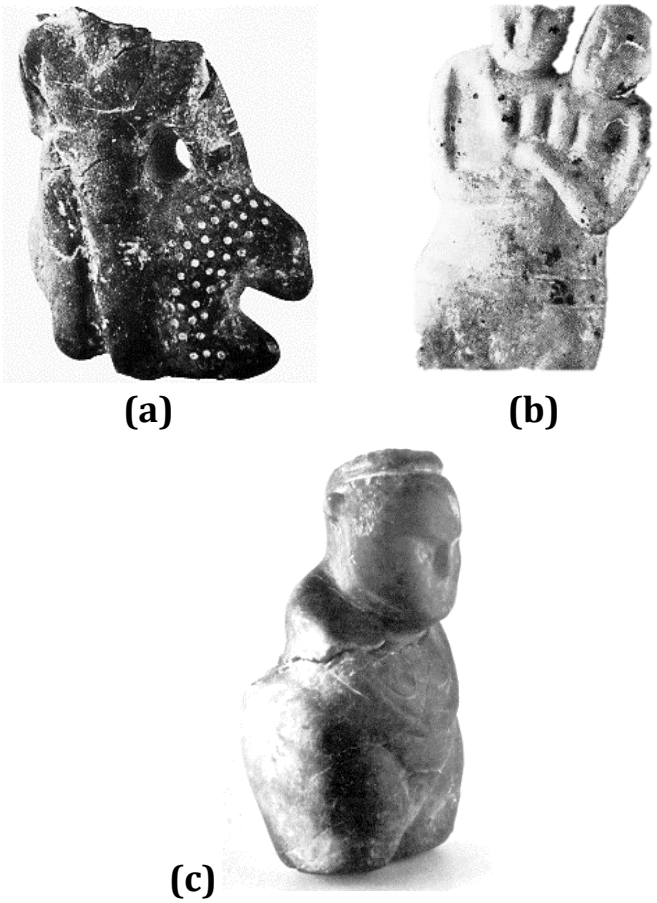


Figure 4.2-21: Selection of figurines from Çatalhöyük: **(a)** man riding an animal, **(b)** double figurine, **(c)** female figurine**.** (Mellaart 1967: pls 70, 74, 80a).

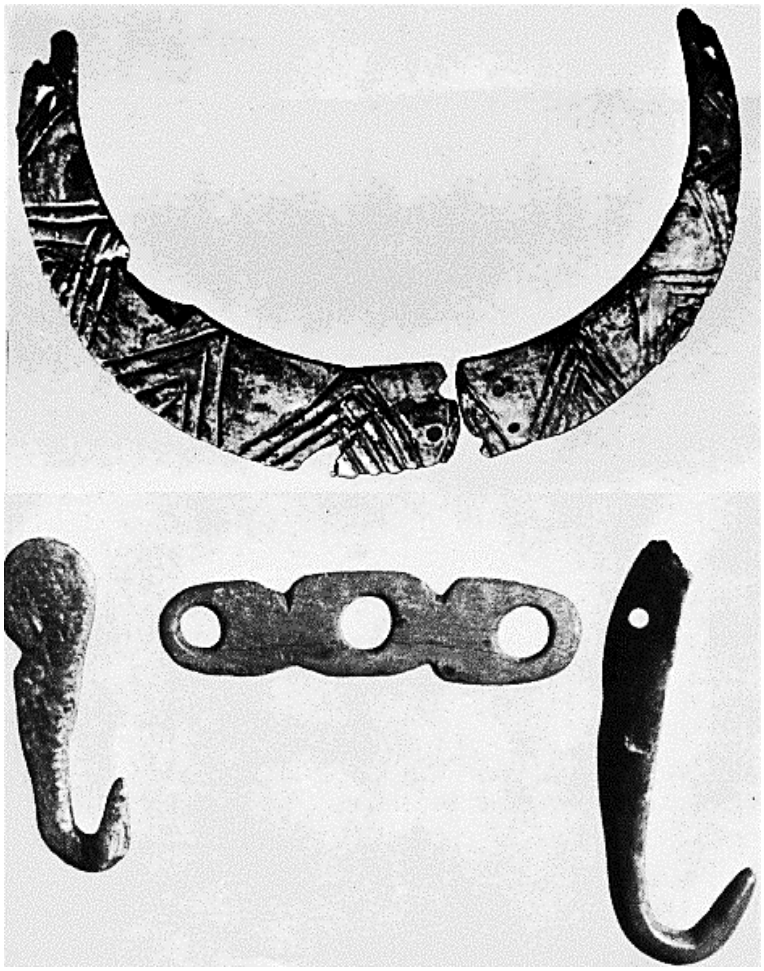


Figure 4.2-22: Bone artefacts from Çatalhöyük. (Mellaart 1967: pls 98 & 101).

Figure 4.2-23: Flint dagger with bone handle, from Çatalhöyük. (Mellaart 1967: pl. XIV).

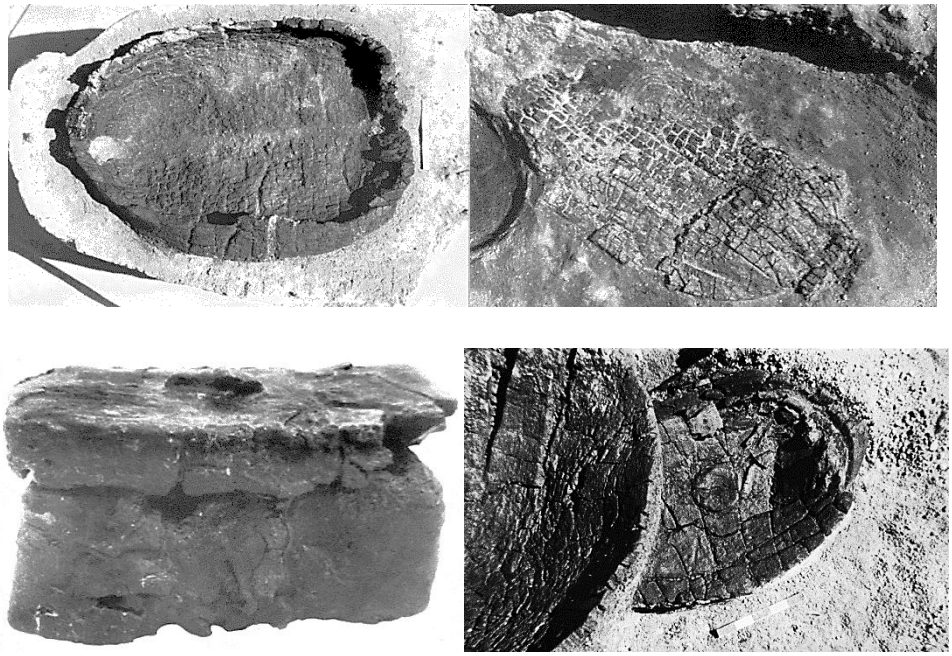
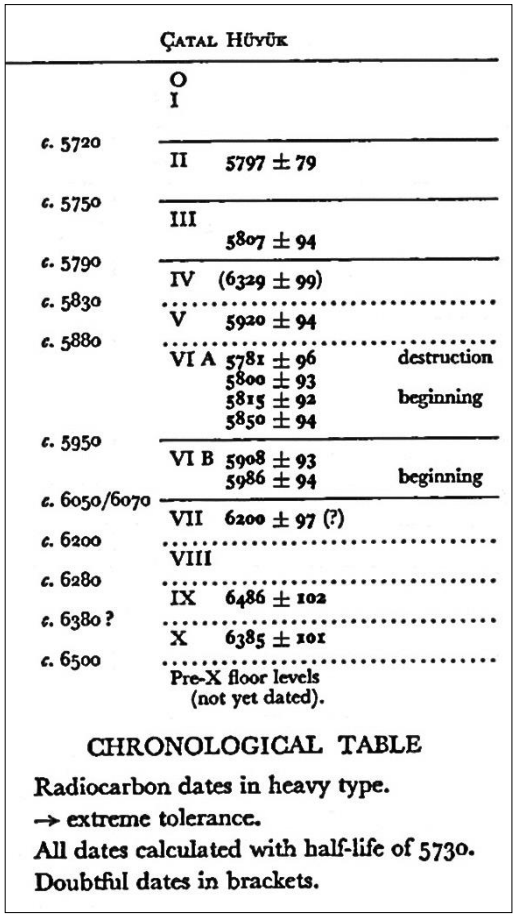


Figure 4.2-24: Selection of wooden vessels from Çatalhöyük. (Mellaart 1967: 105-08).

Figure 4.2-25: Remains of textile fragments (flax), from Çatalhöyük. (Mellaart 1967: 116-18).

TABLES:



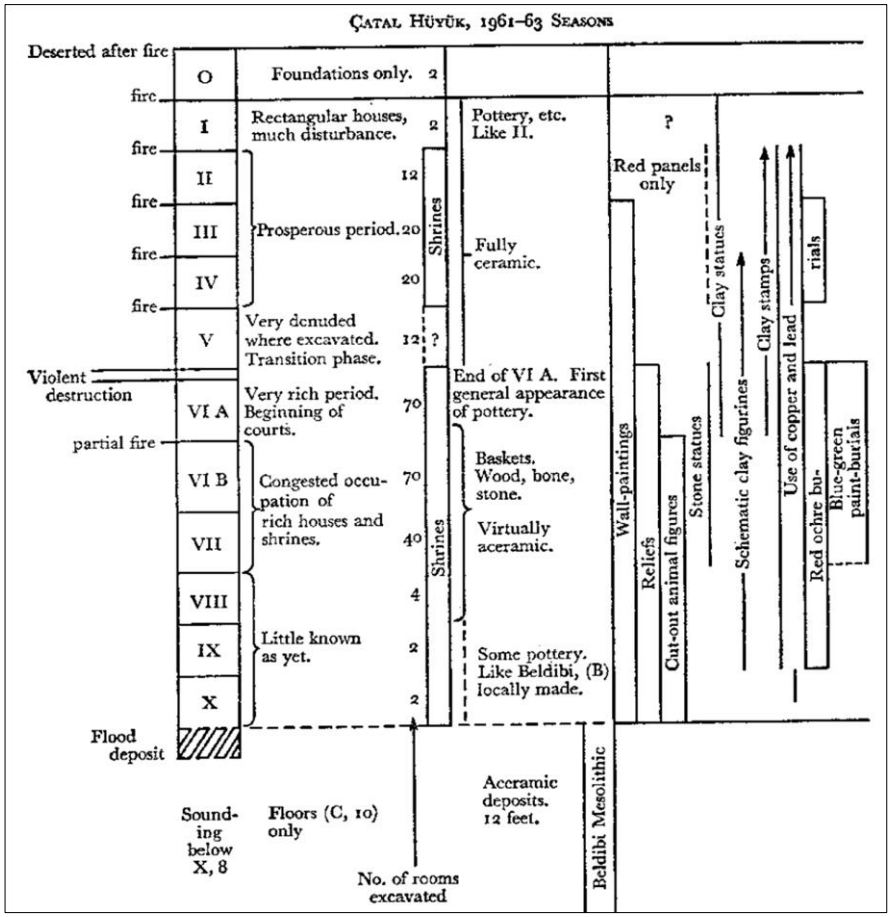


Table 4.2-1: (Left) Mellaart's twelve excavation levels at Çatalhöyük, with the character of each level detailed. **(Right)** chronological table of Çatalhöyük; after from Mellaart's first three excavation seasons in the 1960's (Mellaart 1964a: 115, 119).

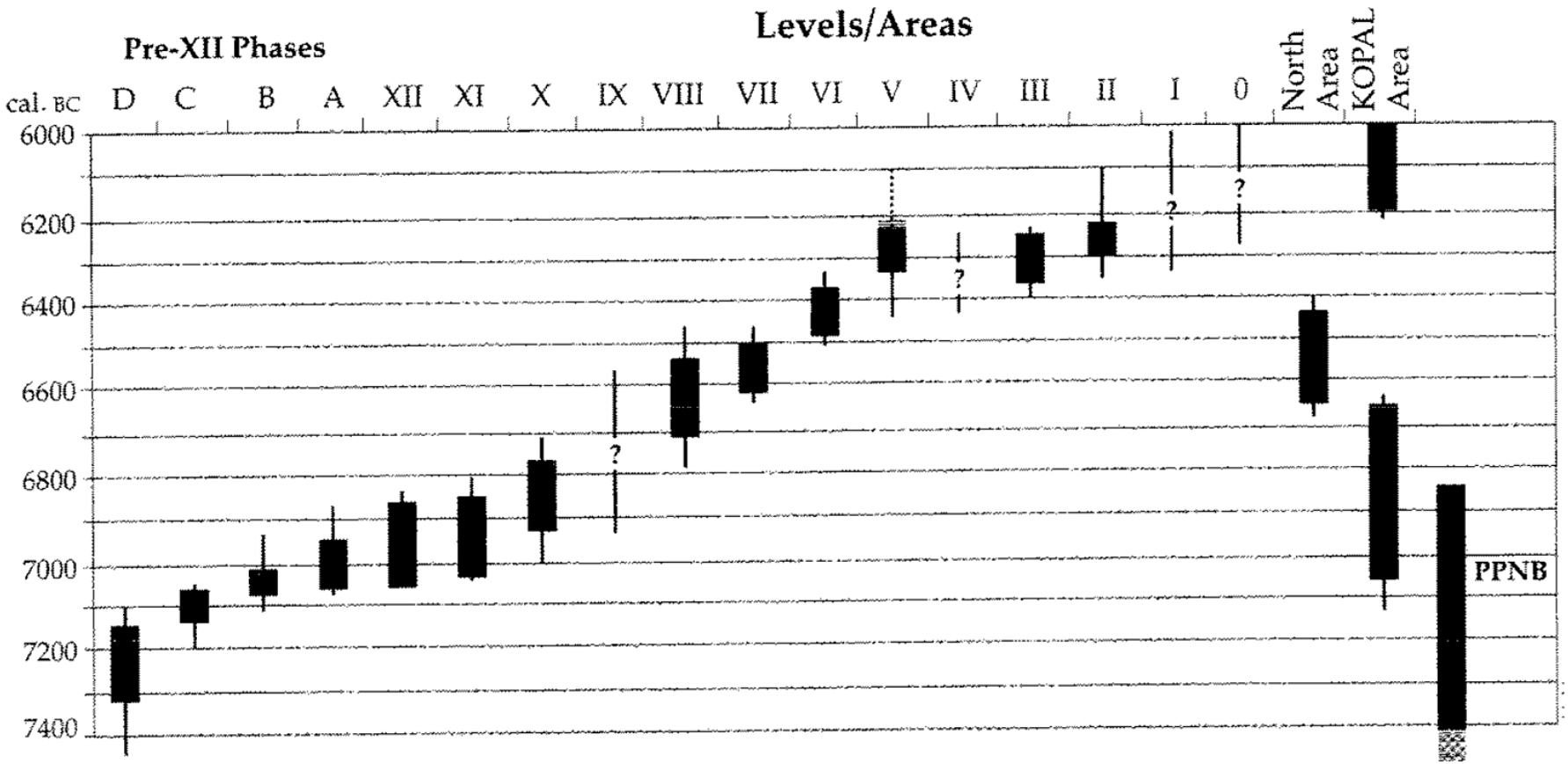
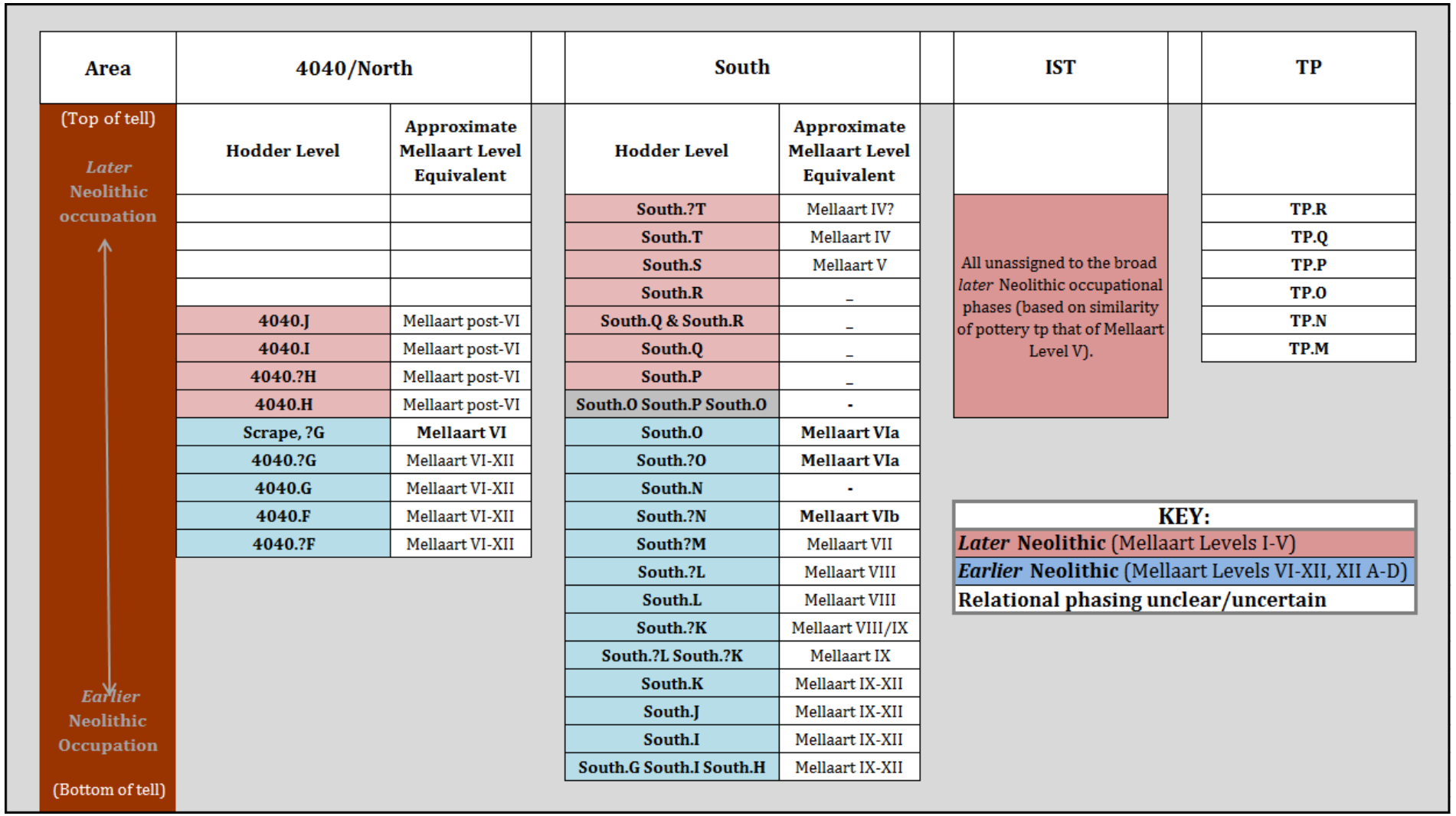


Table 4.2-2: Mellaart's excavation levels, revised by Cessford (2005a: fig. 4.3 p. 76).



Area	4040/North		South		IST	TP
(Top of tell) *Later* Neolithic occupation	Hodder Level	Approximate Mellaart Level Equivalent	Hodder Level	Approximate Mellaart Level Equivalent		
			South.?T	Mellaart IV?	All unassigned to the broad *later* Neolithic occupational phases (based on similarity of pottery tp that of Mellaart Level V).	TP.R
			South.T	Mellaart IV		TP.Q
			South.S	Mellaart V		TP.P
			South.R	_		TP.O
	4040.J	Mellaart post-VI	South.Q & South.R	_		TP.N
	4040.I	Mellaart post-VI	South.Q	_		TP.M
	4040.?H	Mellaart post-VI	South.P	_		
	4040.H	Mellaart post-VI	South.O South.P South.O	-		
	Scrape, ?G	Mellaart VI	South.O	Mellaart VIa		
	4040.?G	Mellaart VI-XII	South.?O	Mellaart VIa		
	4040.G	Mellaart VI-XII	South.N	-		
	4040.F	Mellaart VI-XII	South.?N	Mellaart VIb		
	4040.?F	Mellaart VI-XII	South?M	Mellaart VII		
			South.?L	Mellaart VIII		
			South.L	Mellaart VIII		
			South.?K	Mellaart VIII/IX		
			South.?L South.?K	Mellaart IX		
			South.K	Mellaart IX-XII		
			South.J	Mellaart IX-XII		
			South.I	Mellaart IX-XII		
			South.G South.I South.H	Mellaart IX-XII		
Earlier Neolithic Occupation (Bottom of tell)						

KEY:
***Later* Neolithic** (Mellaart Levels I-V)
***Earlier* Neolithic** (Mellaart Levels VI-XII, XII A-D)
Relational phasing unclear/uncertain

Table 4.2-3: Table detailing Ian Hodder's working revision of the occupational levels across each excavation area (as at 2010).

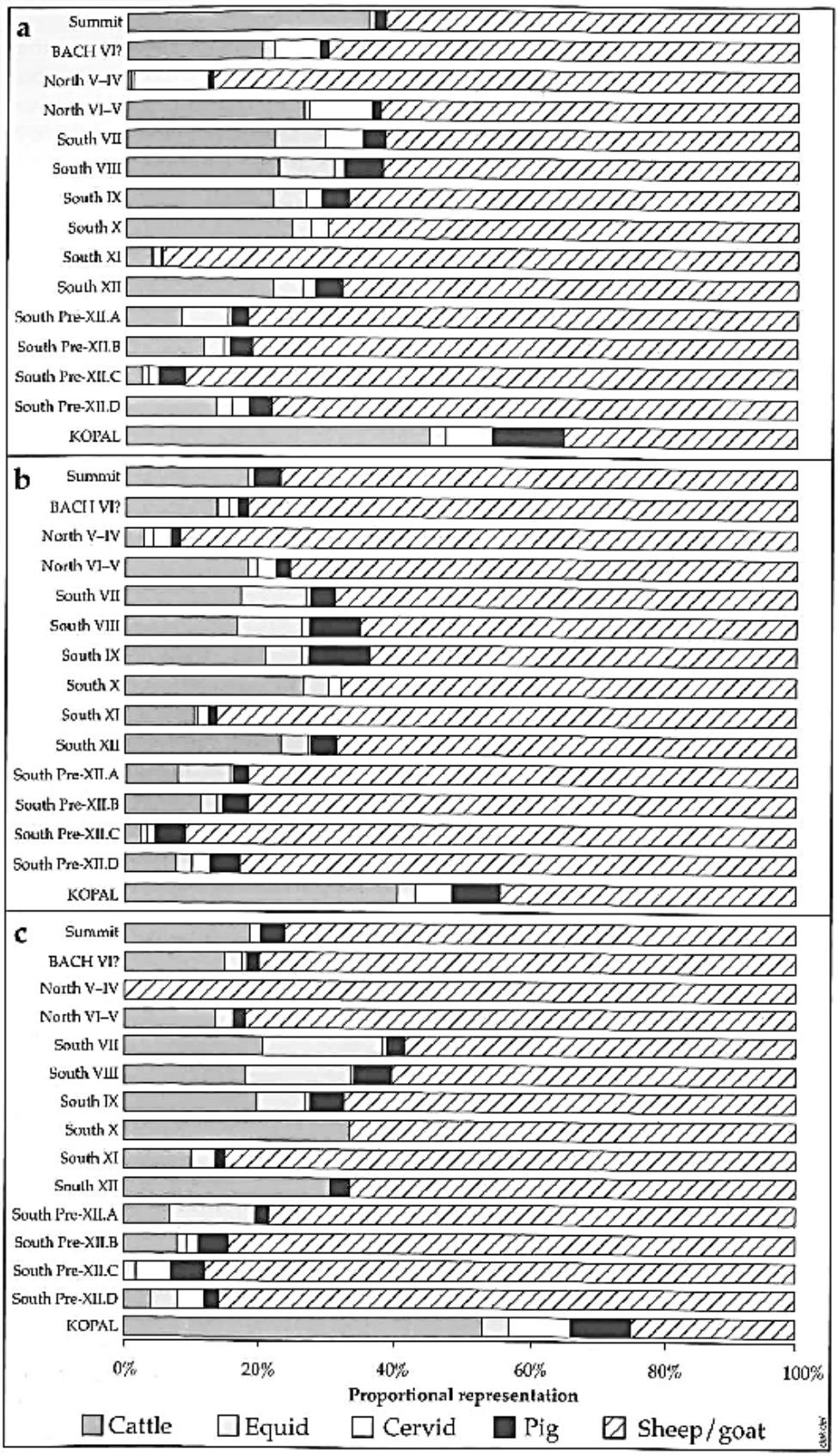
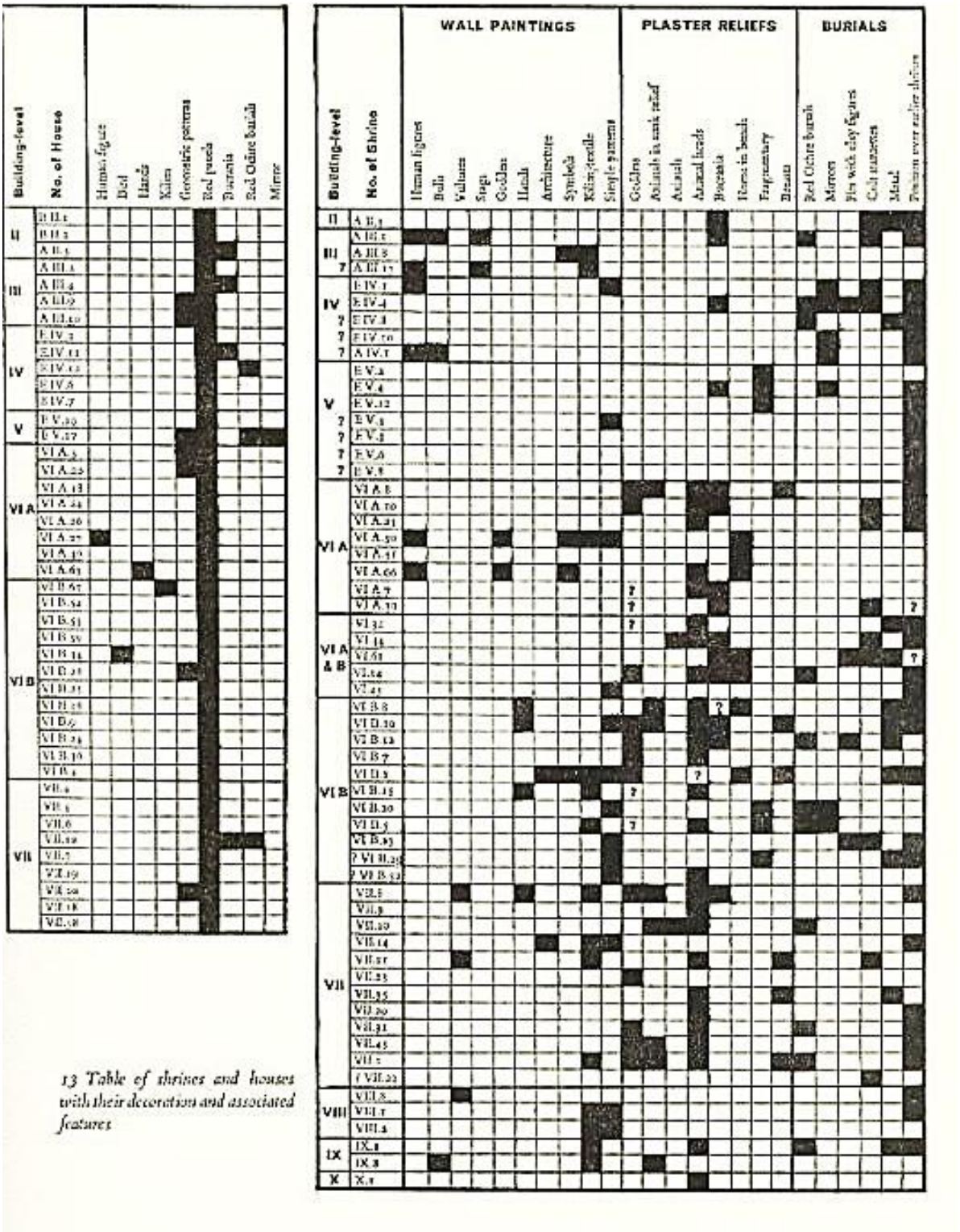


Table 4.2-4: Proportions of the major mammalian taxa at Çatalhöyük East within each excavation area and Mellaart level as identified by a) NISP, b) elements and c) diagnostic zones (Russell & Martin 2005: fig. 2.1 p. 42).

	Botanical Latin	*English*
A. Cereals	*Triticum monococcum* L.	Einkorn wheat
	Triticum dicoccum Schubl.	Emmer wheat
	Triticum aestivum L. / *T. durum* Desf.	Free-threshing wheat
	Hordeum vulgare var. *nudum*	Naked barley
B. Legumes	*Lens culinaris* L.	Lentil
	Pisum sativum L.	Pea
	Vicia ervilia (L.) Willd.	Bitter vetch
	?*Cicer arietinum* L.?	?Chickpea?
	?*Lathyrus sativus* L. / *L. cicera* L. ?	?Grass pea?
C. Other	?*Linum usitatissimum* L.?	?Flax?

Table 4.2-5: Food crops grown at Çatalhöyük East. "?" indicates uncertain status. (Fairbairn 2005: table 1 p. 199).



13 Table of shrines and houses with their decoration and associated features

Table 4.2-6: Mellaart's designated "shrines" and "houses"; with the decoration and associated features detailed for each (Mellaart 1967: 81).

CHAPTER 4.3: TELL SABI ABYAD SITE OVERVIEW

4.3(a) INTRODUCTION

Tell Sabi Abyad is located in the Balikh River Valley in the far north of the modern state of Syria (figures 4.3-1 and 4.1) (Akkermans 1993a: 45). It was identified during the wider Balikh River Regional Survey and has been under extensive excavation led by Professor Peter Akkermans of the University of Leiden and the National Museum of Antiquities, Leiden, the Netherlands from 1985 until recently when the political situation made work impossible (Akkermans *et al.* 2012, Akkermans *et al.* 2010, Akkermans 1996a, Akkermans 1996b, Akkermans & Verhoeven 1995, Akkermans 1993a: 45, Akkermans 1989, Akkermans & Duistermaat 1996, Verhoeven & Akkermans 2000, Verhoeven 1999). The final excavation season took place in the spring of 2010. Research has been systematic, organised by a 10 m by 10 m grid system with excavation squares separated by 0.5 m baulks. Large teams combining students and local workmen resulted in large horizontal spreads of occupation being revealed; with entire village plans uncovered to depths of many metres of stratigraphy within a single season of work.

Excavations at Tell Sabi Abyad have yielded huge numbers of small finds, especially when considering retrieval processes. Floatation (aiming to collect botanical material for dating and botanical analysis) was limited, carried out for soil samples only (usually taken from ovens and similar ashy contexts). In addition, dry sieving was undertaken in certain contexts only; ordinarily "special find" contexts such as burials. Sediment from all other contexts was neither floated nor sieved (Merel Brüning, pers. comm.). This retrieval strategy means a high proportion of small finds at Tell Sabi Abyad come from within buildings and other features, in contrast to Boncuklu and Çatalhöyük (see Chapters 6, 7 & 8). Though excavated sediment from external and open areas is somewhat neglected (neither systematically sieved nor floated), resulting in low proportions of finds coming from external areas, or areas devoid of features (Chapter 8). Internal areas are meticulously excavated. The workmen tend to see finds in the ground (rather than them being retrieved from sieves or flotation); in particular, excavations at Tell Sabi Abyad have revealed a large number of discrete assemblages of clay objects and other finds, *in situ* within buildings.

4.3(b) OCCUPATION OVERVIEW

Sabi Abyad is actually a group of four prehistoric tells, clustered together and named Tell Sabi Abyad I-IV (the main mound is most often simply referred to as *Tell* Sabi

Abyad, the other mounds are referred to as *Sabi Abyad II, III* and *IV*). The tells are oriented north-south in a linear pattern, and vary in size from 0.5 hectares, up to 5 hectares (figure 4.3-2). Tell Sabi Abyad (tell I) is the largest mound, with Neolithic occupation covering much of mound, along with a large Bronze Age fortress at the summit. As such, the main tell (tell I, *Tell* Sabi Abyad) has been the most extensively excavated, with seasons focusing on five operations (I-V) or areas within the site (figures 5.3-2 and 5.2-3) (Akkermans 1996a, Akkermans 1996b, Akkermans 1993a Akkermans & Verhoeven 1995, Akkermans & Duistermaat 1996 Verhoeven 1999). Occupation shifted between operations and also from tell to tell (table 4.3-1). The earliest Neolithic occupation attested to date comes from Sabi Abyad II which was settled over four occupational levels, each covering around 100 years from the end of the 8th millennium to the first quarter of the 7th millennium cal. BC (Verhoeven & Akkermans 2000: 1; Nieuwenhuyse, Akkermans & van der Plicht 2010: fig. 5 p. 78). This corresponds to the Late PPNB or so-called "Initial Pottery Neolithic", representing the very start of the Early Pottery Neolithic phases at the site (c. 7,100-6,700 cal. BC). Sabi Abyad III was settled soon after. Though analysis is ongoing, occupation at tells II and III (only trench H has been analysed so far) appear to be largely contemporary (table 4.3-1). For a short time, occupation of Sabi Abyad II and III also co-existed with a small area of settlement on the main tell, within the area known as operation III (unpublished) . This represents the earliest settlement on Tell Sabi Abyad I. Beginning at the start of the 7th millennium cal. BC, operation III's settlement marks the start of the Initial Pottery Neolithic phase c. 6,900 cal. BC. Operation III on Tell Sabi Abyad (I) is the area with the longest duration of occupation across all tells at Sabi Abyad, remaining occupied until the abandonment of the entire complex of mounds in the first half of the 6th millennium BC (c. 5,700 cal. BC).

Smaller tells Sabi Abyad II and III were abandoned shortly after c. 6,700 cal. BC, leading to an expansion of settlement across Tell Sabi Abyad (Nieuwenhuyse, Akkermans & van der Plicht 2010: fig. 5 p. 78). Occupation soon spread south into operation IV, quickly followed by operation V to the east, and finally operation I on the southeast side of the tell (table 4.3-1 and figure 4.3-3). It seems no coincidence that the so called 8,200 ka. climatic event corresponds to a shift of population west to east (within Tell Sabi Abyad I) c. 6,000 cal. BC (Akkermans *et al.* 2010). This abrupt cold event, attested in a range of climatic data peaks at around 6,225 cal. BC, and though the effects of climate change are not fully understood, the timing at Sabi Abyad is notable. Many changes are seen both economically and culturally: most notably the shift from pig to cattle for the main meat

source, the beginnings of milk production (from sheep and goat) and fibre production- attested by a huge increase in the density of spindle whorls (Akkermans *et al.* 2010). There are also new types of architecture, tholoi which co-exist with the earlier style of rectilinear buildings (exemplified by operation I, figure 4.3-4) (Akkermans *et al.* 2010: fig. 3). Other hallmarks of the Halaf appear at this time; the beginnings of the decoration of pottery with intricate geometric designs, and stamp seals become wide spread, used extensively across the site within the Halaf time period, especially within level 6 of operation I (Akkermans *et al.* 2010).

Despite the expansive Neolithic occupation, spread over four tells, publications are heavily focused on one area: operation I of the largest mound, and specifically the so-called "Burnt Village" of Level 6 within it (Akkermans 1996a, Akkermans 1996b, Akkermans 1993a, Akkermans 1989, Akkermans & Verhoeven 1995, Akkermans & Duistermaat 1996, Verhoeven 1999). Sabi Abyad's pre-Halaf, pre 6,300/6,200 cal. BC phases of settlement have some significant variations, and contrast to the later, Halaf levels, yet small geometric clay objects are found both before and after the climate change event. Therefore in addition to detailing the archaeology of Tell Sabi Abyad's main tell, information of the earlier occupations at Sabi Abyad, covering the period of the end of the 8th to the late 7th millennium BC (c. 7,100-6,300/6,200 cal. BC), as represented on tell I (mainly operation III) and also at Sabi Abyad II and III is outlined below (table 4.3-1).

4.3(c) SABI ABYAD III

(i) Overview

Upon commencement of full scale excavation in 2010, Late Neolithic (Halaf) material was found just a few centimetres beneath the surface in some areas at Sabi Abyad III. Field data is still under analysis, yet results from square H reveal occupation here had begun by at least the 8th millennium cal. BC, and ran into the first half of the 7th millennium BC (spanning the Late PPNB into the start of the Early Pottery Neolithic) (table 4.3-1).

(ii) Site Character: Sabi Abyad III

Prehistoric material is located immediately under the surface, just a few centimetres deep in some trenches. Sabi Abyad III has Halaf material in the upper layers, followed directly and continuously by PPNB material. There is no cultural change from the Halaf to PPNB levels; the only difference is the disappearance of pottery. However, there is a

distinct change in character within the PPNB levels, which consists mainly of tripartite structures and platforms. The platforms are constructed from mudbricks; tiled onto the floor (figure 4.3-5). Buildings are also made of mudbrick and are large, generally filling an entire trench (figure 4.3-6a). Buildings across Sabi Abyad III are repeatedly rebuilt to the same orientation and in the same location. These buildings have yielded very few artefacts or other archaeological materials. In general, there are few finds from Sabi Abyad III compared to other mounds of Sabi Abyad excluding the tell's burials (see below). Therefore, it seems these buildings were possibly cleared out before abandonment and rebuilding. Most of the buildings uncovered from the PPNB levels possibly represent the basement or lower ground level, consisting of small rooms used for storage, such as in square J9 where in a narrow part of the building there seems to be a staircase (figure 4.3-6). The open areas in between buildings and platforms have yielded little archaeology.

(iii) Burials

Burials are frequent in both Sabi Abyad III's Halaf and PPNB levels (total of 64 approximately), and are generally restricted to one edge of the tell; the north eastern part which is an open area, devoid of structures. Burials represent all ages, being found both in groups and singly. Sabi Abyad III's primary burials all have heads attached, but there are also some depositions of secondary burials represented mainly by the long bones and skulls (often only the cranium without the mandible). Most of the primary, articulated burials have few grave goods, restricted to beads, stone and ceramic vessels. Sabi Abyad III also has a feature named the "Death Pit" (figure 4.3-7); a large, round pit containing ashy areas-within which are multiple internments of articulated and disarticulated individuals and groups. Some of the human bones are burnt but only parts of each, suggesting these are not cremations but the result of a fire being placed on top of the burial. Other burials in this feature are laid on a bed of pot sherds. No grave goods have been uncovered in this area, but the fill contains debris in the form of pot sherds and animal bones. From the many burials at Sabi Abyad III, there are few artefacts. Some burials contain beads and pots, others have grinding stones and slabs, or figurines, yet all grave goods are rare, and when present, found in low densities compared to other mounds of Sabi Abyad. Sabi Abyad III however does appear to evidence some distinctive patterning in the use and disposal of figurines. On this mound figurines are found only in ash pits. The elements present are yet to be studied, but appear to be mainly zoomorphic. 16 geometric clay objects or "tokens" have also been recovered.

4.3(d) TELL SABI ABYAD I: OPERATION II

Operation II on the main tell was occupied in the Pre-"Transitional" and Early Halaf settlement phases of the late 7th and early 6th millennium BC (c. 7,000-5,800 cal. BC) (table 4.3-1) (Akkermans *et al.* 2012: 307;Nieuwenhuyse, Akkermans & van der Plicht 2010: fig. 5 p. 78; TSAEP 1988-2010). A total of eight settlement layers are represented, numbered level 8 (oldest) to 1 (youngest), with occupation ending in the middle of the Early Halaf period (Akkermans *et al.* 2012: 307, The Tell Sabi Abyad Excavation Project). The excavation area represented by operation II is small, comprising a single 10 m by 10 m excavation square, V6 (figure 4.3-3 and 4.3-8). Clear architecture can be seen from level 7, where the earliest archaeological activity appears. A "T-shaped" building, covering much of square V6 emerges, along with a tholos in the southwest corner (figures 4.3-8 and 4.3-9) (TSAEP 1988-2010). Continuing into level 6, the building was burnt at some point post c. 6,050/6,020 cal. BC, and left standing for a significant period of time after this event (Akkermans *et al.* 2012: 321, 322). The subsequent level 5 is represented by an open area with fire (TSAEP 1988-2010).

(i) The "T-Shaped" building

The "T-shaped" building (or Building I) in V6 measures approximately 10 m by 7 m. It displays a remarkable level of preservation, with walls standing up to 1.5 m in height (Akkermans *et al.* 2012: 307). The T-shaped building is very regular in layout, subdivided into various rooms, the largest (room 5 at the southern end) measuring 3 m by 1 m; with some (rooms 3, 4, 6, 7 and 8), presumably storage rooms just 1.5 m^2 (figure 4.3-9). With no evidence of floor level entrances (aside from a single, small, porthole style opening to room 5; closed with a large flat stone), the rooms must have been entered via the roof (as were the buildings at Çatalhöyük, see Chapter 4.2), unless there was an upper story and what remains is the basement level below (Akkermans *et al.* 2012: 308). Its scale, destruction through burning, the number and quality of finds preserved *in situ*, and the likely ritual association of the T-shaped building (see below) all show strong similarities to the Burnt House of TT6 at nearby Tell Arpachiyah, dated to the mid-5th millennium cal. BC (Late Halaf, c. 5,300 cal. BC, Campbell 2000b. See Chapters 3 and 10).

(ii) The Burial: Room 8

Placed directly onto the floor of room 8, a small room in the northeast corner of the building, was the burial of a woman aged 14 to 20 years (figure 4.3-10). Laid in a crouched position on her left side, both hands were underneath the body. Half of a

basalt mace head was found beneath the woman (an extremely rare find at Tell Sabi Abyad), whilst a small piece of yellow ochre lay beneath her skull (Akkermans *et al.* 2012: 312, 314). Room 8 acted exclusively as a burial chamber, containing no other features or artefacts. The placing of a burial in room 8 is intriguing, and has been interpreted as the cause of the extensive burning of the T-shaped building. The relationship of the woman to the building is uncertain. What is clear is that at some time after the woman's internment, the building was intentionally set alight. Notably, the extensive burning activity evidenced within the T-shaped building, raging at high temperatures and causing extensive damage did not affect room 8 or the burial inside it (figure 4.3-10), supporting the interpretation of the fire as a deliberate, managed, mortuary ritual act (Akkermans *et al.* 2012: 310-12, 314, 321).

(iii) Artefacts within the T-Shaped Building

Preserved in the fill of various rooms within the T-shaped building are large quantities of finds including bone awls and groundstone items of various types-grinders, pestles, mortars, polishers and palettes (a total of 371 finds excluding pottery). Groundstone tools constitute the most common category of finds, 142 pieces. Clay figurines are also common, as are pierced discs of pottery and stone, sling missiles, clay spindle whorls, stone beads and labrets. Containers of pottery and whiteware are present in large quantities (figures 4.3-11 and 4.3-12) (Akkermans *et.al.* 2012: 314, 316-18, 320, 321, figs 7, 8 & 9, tbls. 2 & 3; TSAEP 1988-2010). Within the burnt building, sealings (defined by the Tell Sabi Abyad team as a clay stopper displaying stamp seal impressions) are abundant, along with jar stoppers (clay which has clearly been shaped around a container in order to seal it, yet lacking seal impressions). Combined, they are the second most abundant artefact category (excluding pottery), totalling 66 pieces, distributed across rooms 1, 3 and 5 (figure 4.3-12, 4.3-13 and table 4.3-2) (Akkermans *et.al.* 2012: 314, 316, fig 7 p. 314, tbl. 2 p. 315). This count also includes four objects which can only be described as bullae (see discussion in Chapter 8); all from room 3 (Akkermans *et al.* 2012: 316). "Tokens" are the third most common find in the burnt building. A total of 57 were recovered from four rooms (rooms 1, 3 and 5); more than half of them from room 3 (figure 4.3-12 and table 4.3-2) (Akkermans: 314, 316, fig 7 p. 314, tbl. 2 p. 315). The dense concentration of finds within a few rooms in particular, has led the excavator to suggest they were likely stacked on shelves, or possibly suspended from the walls (Akkermans *et al.* 2012: 317, 318, 320, 321).

The presence and distribution of clay objects, sealings and bullae, concentrated in specific rooms within the burnt T-shaped building, and placed alongside a variety of other finds poses intriguing questions related to their function. Certainly, the possibility of clay objects and sealings being placed together, within specific rooms, and in large numbers suggests they were intentionally stored, kept as a record or administrative archive reminiscent of the later, well attested palace and temple archives of the 3rd millennium in Mesopotamia (see chapter 2.3a v for discussion). Their presence within a building also housing large quantities of storage vessels supports this notion. In addition, the presence of a burial in room 8, and the intentional, possibly ritual burning of the building, with the finds left *in situ*, bring up the possibility of a ritual function to these items.

4.3(e) TELL SABI ABYAD I: OPERATION I *&* THE "BURNT VILLAGE"

(i) Overview

Operation I at Tell Sabi Abyad I is represented by eleven continuous occupation levels spanning the mid-Early Pottery Neolithic into the Middle Halaf period, c.6,500/6,400-5,700 cal. BC (Akkermans & Duistermaat 1996: 17; Duistermaat & Schneider 1998: 90, Nieuwenhuyse, Akkermans & van der Plicht 2010: fig 5 p. 78) (table 4.3-3). Operation I clearly tracks the gradual change in settlement nature over time charting the Early Pottery Neolithic (Level 11), "Pre-Halaf" (Levels 11-7), "Transitional" Halaf (Levels 6-4) and finally the true "Early" and "Middle" Halaf (Levels 3-1) (Akkermans & Verhoeven 1995: 8, Akkermans & Duistermaat 1996: 17, table 4.3-1).

The Halaf (6,200-5,000 cal. BC), emerging from a background of small farming villages, leading into urbanism and complex society by the end of the 4th millennium BC was therefore important in terms of the social, economic and political developments that happened within this transitional period. Due to its outstanding preservation and chronological importance as the first of the "Transitional Halaf" levels, the level 6 village has been most extensively excavated. An extensive fire destroyed most of the buildings c. 6,000 cal. BC; however this led to the preservation of a wide variety of finds and of the buildings themselves, allowing many aspects of village life at this moment in time to be reconstructed (Akkermans & Duistermaat 1996: 17). One notable level 6 artefact category from this village is the clay sealing, with Tell Sabi Abyad claiming to be the earliest documented site to demonstrate the extensive use of sealings in the Near East. Questions such as why this practice was adopted, how it functioned and its impact on society may all be answered by analysis of the use of sealings at this site.

(ii) Level 6 Village Introduction

Level 6, the Burnt Village is exceptionally well preserved, with buildings standing to a height of 1.40 m in many places, and an abundance of *in situ* finds (figure 4.3-14) (Akkermans & Duistermaat 1996: 17; Akkermans & Verhoeven 1995: 8-9). Sabi Abyad, like most Halaf sites, has a mixture of rectangular (figure 4.3-4) and circular buildings (or tholoi) (figure 4.3-15), with buildings densely packed in an organic fashion (figures 5.16) (Akkermans & Verhoeven 1995: 10; Akkermans & Duistermaat 1996: 17; Duistermaat & Schneider 1998: 90). The layout and detail of buildings within the village is therefore diverse, as characterised by most Halaf sites. The buildings vary significantly in size, with the majority subdivided into rooms or compartments, each ranging from just over one cubic metre, to large open plan spaces. The village is constructed of terraces (figure 4.3-17) with access to buildings and internal rooms varying between doorways, crawl holes (figure 4.3-18) and those with neither, presumably accessible via the roof (Akkermans & Verhoeven 1995: 10).

(iii) The Sealings

One of the most enigmatic features of the Burnt Village is the recovery of 312 clay sealings, the majority bearing stamp seal impressions. Equally as intriguing is the complete lack of any stamp seal from this level of settlement (Akkermans & Duistermaat 2004: 3; Duistermaat 1996: 342; Akkermans & Duistermaat 1996: 17). Dating to c. 6,000 cal. BC these are the earliest examples of stamped sealings uncovered to date, raising intriguing questions in relation to their function in this, the earliest phase of their use. 300 of the sealings were found within buildings at the village, both tholoi and rectilinear. The largest concentrations are within rectilinear buildings II and IV, yet sealings are found within a total of five buildings, over twelve rooms. 63% have stamp seal impressions (table 4.3-3) (Duistermaat 1996: 353).

The 312 sealings can be divided into 31 design groups ranging from geometric patterns, to naturalistic designs including trees, human figures, and a goat like animal (Akkermans & Duistermaat 2004: 2, Duistermaat 1996: 353). Data suggests at least 77 different stamp seals (67 of the initial 300 uncovered) were in use within Level 6 (Verhoeven 1999c: 211; Akkermans & Duistermaat 2004: 2). The sealed items were all portable containers, predominately ceramic vessels and baskets (Duistermaat 1996: 342-351). Analysis suggests all level 6 sealings were made either from local clay

sources, or clay from the immediate surroundings, interpreted as evidence that the use of sealings was an entirely local affair (Duistermaat & Schneider 1998: 93, 96)

(iv) "Tokens" & Other "Small Finds"

The buildings at Sabi Abyad level 6 have an abundance of additional *in situ* finds including: ceramic and stone vases, flint and obsidian tools, pestles and mortars, grinding stones, labrets, axes, and human and animal figurines (figure 4.3-19) (Akkermans & Duistermaat 1996: 17). Thousands of pottery sherds of a variety of wares have been found (figure 3.9 right), including dark-faced burnished ware from the Levant (Akkermans & Verhoeven 1995: 25). Pendants, beads, labrets and small highly crafted bowls are also found in significant quantities (Akkermans & Verhoeven 1995: 27). "Tokens" in the form of small geometric shaped objects of unbaked clay (and a few of stone) number 167 in level 6, found in association with sealings, spindle whorls, pierced discs and figurines across two locations (building II room 6, building V, room 7; Spoor & Collet 1996: 441). The "tokens" are interpreted as counting devices and are described as representing 9 basic geometric forms (figure 4.3-20) (Spoor & Collet 1996: 441, Verhoeven 1999: 240).

(v) Trade & Exchange

Long distance trade and exchange is evidenced by the presence of many non-local raw materials, and the goods crafted from them. Cedar wood timbers from the Levant, copper ore, obsidian, basalt from Anatolia, and other stones including serpentine, chlorite, steatite and dolerite from the Euphrates Valley region of north Syria and south eastern Anatolia are all found within level 6 of operation I at Tell Sabi Abyad (Akkermans & Verhoeven 1995: 20-21, 26-28). Within a 20 km radius (a 4 hour walk) were four contemporary sites, offering the opportunity of exchange and interaction on a local level (Akkermans & Duistermaat 1996: 26; Verhoeven 1999: 206).

(vi) Ovens & On-Site Activities

At least 7 ovens have been uncovered across the site, inside tholoi, rectilinear buildings and in open areas (figure 4.3-21) (Akkermans & Verhoeven 1995: 10; Akkermans & Duistermaat 1996: 17). Many ovens are large, reaching up to 1.50 metres in height, and show signs of long use and constant maintenance (Akkermans & Verhoeven 1995: 13). Many, such as oven 2 in building I, show signs of intensive domestic use; with ceramics, stone mortars and pestles, bone awls and clay sling missiles present in the area immediately in front of the oven (Akkermans & Verhoeven 1995: 12). Some of the

larger buildings have working platforms made of brown loam, suggestive of food processing and craft production. For example room II in building II (square Q13, see plan figure 4.3) has a platform measuring 1.60 m x 1.25 m x 0.20 m (Akkermans & Verhoeven 1995: 12).

(vii) Nature of Village Occupation

The presence of vast numbers of sealings at the level 6 Burnt Village have come to be interpreted as the communal storage of goods, by an absent, pastoral component of Sabi Abyad society. This argument is based not merely on the presence of so many sealings, but also incorporates the architecture of the settlement and the concentration of sealings within three to four rooms of two rectangular buildings. The apparent abundance of storage rooms within the relatively small village, the fact local clays were used to make all the sealings uncovered and an apparent absence of elites at the settlement are also crucial to their argument (Akkermans & Duistermaat 1996; Akkermans & Verhoeven 1995; Akkermans *et al.* 1996; Akkermans & Duistermaat 1996; Duistermaat 1996; Duistermaat & Schneider 1998; Verhoeven 1999; Akkermans & Duistermaat 2004).This early suggestion (Akkermans & Duistermaat 1996) led to a more developed interpretation of the sealings as representing the communal storage of nomads (Verhoeven 1999). Akkermans and Duistermaat (1996), stress the concentration of sealings within two buildings. Indeed two thirds, or 201 of the 300 sealings uncovered by the time of publication, were found in room 6 of building II, with 19 found in room 7 of building II and a further 36 sealings in building V. Their context: the concentration within a few rooms, and their association with small geometric-shaped clay objects, miniature vessels and figurines (representing goods and services) was interpreted as the artefacts functioning together in an administrative system, within larger buildings interpreted as administrative archives (Akkermans & Duistermaat 1996: 18-19, see Chapter 2 for evaluation of this argument).

The lack of seals within the level 6 village suggested to the excavators that the seal holders did not reside there permanently. The number of seals in circulation would correspond to the number of nomads using the site as a base (Verhoeven 1999: 211). The 67 different sealings represented are proposed as representing 67 different stamp seals, indicating 67 families or groups of 6 to 10 people, making a total of 400 to 670 nomads (Verhoeven 1999: 211). This nomadic population estimate equates to just less than one or (taking into account the unexcavated areas of the site) two storage rooms per family (Verhoeven 1999: 215-16). The interpretation presented by the excavators

is unconvincing. One of the main components of Akkermans *et al.*'s interpretation of the use of sealings at Tell Sabi Abyad is the two different shaped buildings, taken as representing two different lifestyles. However, in terms of finds within each building, there is nothing in the evidence to support the notion of opposing uses of buildings of either shape.

The abundance of storage at the site is also stressed by the excavators, stating there is far too much storage than necessary for the residents alone. Even if we take their interpretation of the use of space into account, and presume only 3 to 5 tholoi were permanently occupied, the rest of the site being used for storage, there is not an automatic correlation between number the of residents and volume storage needed. Lastly, an oversight of the excavator's interpretation of the use of sealings at level 6 Sabi Abyad is the lack of any solid evidence for the presence of nomads either at the site, or in the immediate region in general. Basic evidence of temporary camps, even if they were only occupied for a few weeks per year, would be expected on the edge of Sabi Abyad in the form of fires, hearths and food processing equipment (such as large pestles and mortars along with grinding stones). A review of the use of space at the site, along with the duration of occupation of the level 6 village, reveals external nomads are not necessary to account for the number of seals in operation at the settlement. Exchange on a local basis, within a diameter of 20 km is a real possibility. Regardless, it is clear an increase in social organisation, trade and exchange, along with an increasing sense of personal ownership contributed to the appearance and use of sealings at this Early Halaf settlement, becoming more complex and widespread in later times throughout the entire Near East.

4.3(f) CONCLUSION

Sabi Abyad is truly an exceptional site, with excellent preservation and a large number of small finds, despite the vastly reduced use of sieving and flotation in comparison to the other case study sites. Its long duration of occupation, seeing both the introduction of pottery at the end of the 8th millennium, and the 8.2 ka. climatic event 1000 years later, allows the effect of various social, technological and environmental changes on the communities of Tell Sabi Abyad to be examined. Particularly interesting is the wide horizontal exposure of settlement within various occupational phases; this allows analysis of the distribution of various types of finds and activities across an entire village. Unlike the other case study sites, Tell Sabi Abyad has a number of extremely well preserved rooms and buildings, with artefacts recovered *in situ*, including clay

objects and probable archives in some locations and phases. This is true of the Level 6 Burnt Village of the main tell, but also other areas and phases of settlement. This allows their exact use at Tell Sabi Abyad to be assessed, promising to provide a unique insight to the manufacture, use, and disposal of clay objects at various stages of this sites' long occupation.

ILLUSTRATIONS

FIGURES:

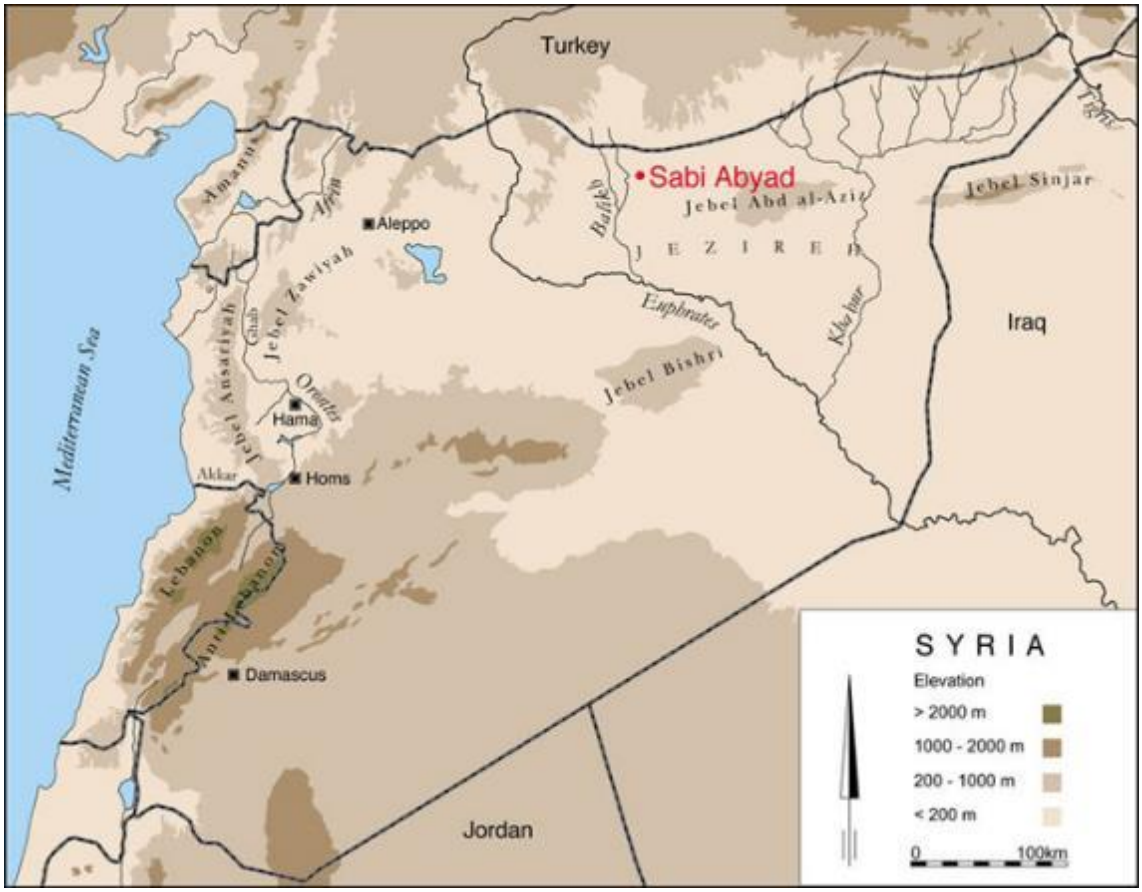


Figure 4.3-1: Map of the Near East, showing the location of Sabi Abyad (Akkermans 2014a).

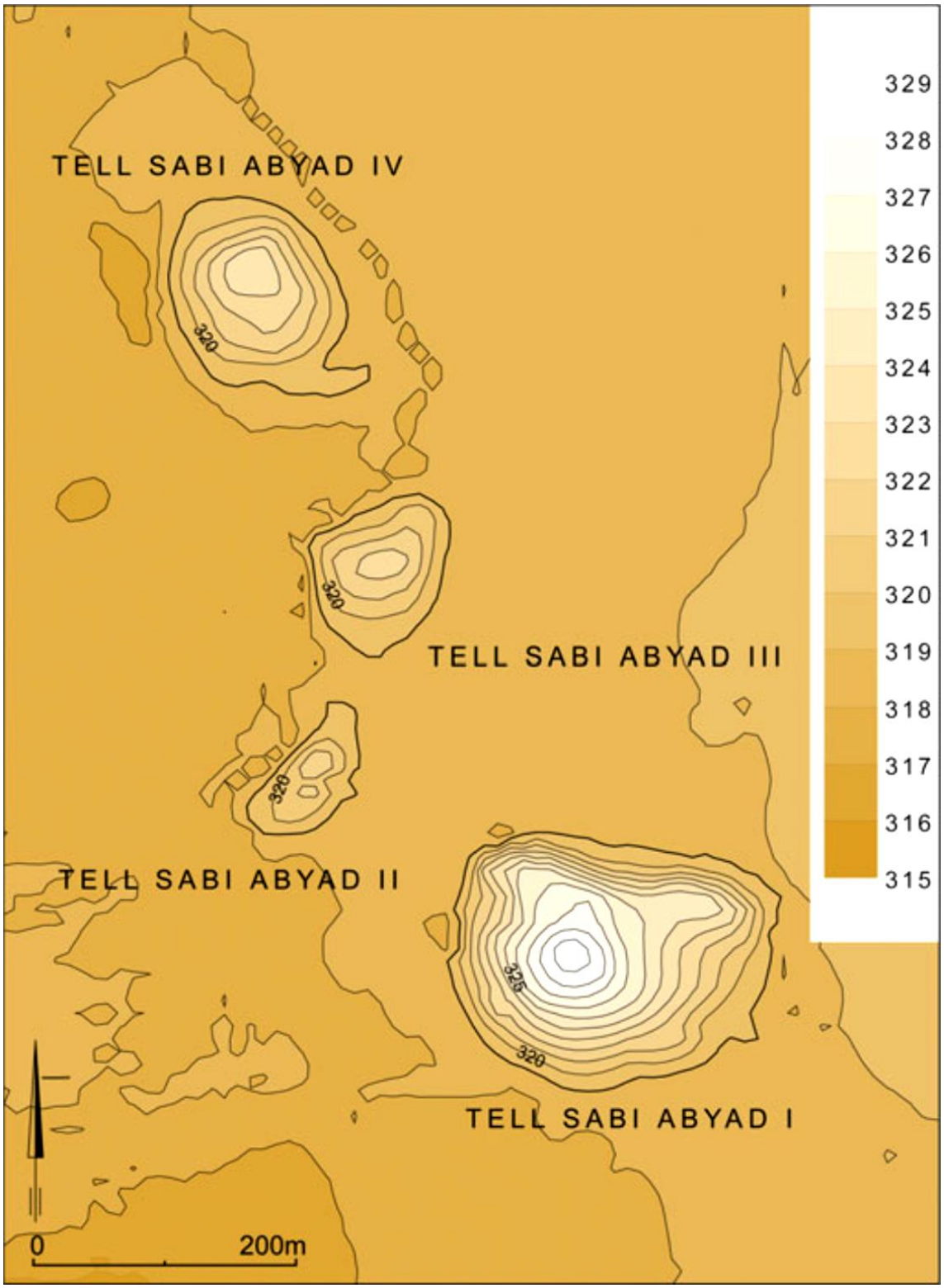


Figure 4.3-2: Distribution of the four mounds or "tells"; Sabi Abyad I-IV, which together make up the site of Sabi Abyad (Nieuwenhuyse, Akkermans & van der Plicht 2010: fig. 3 p. 76)**.**

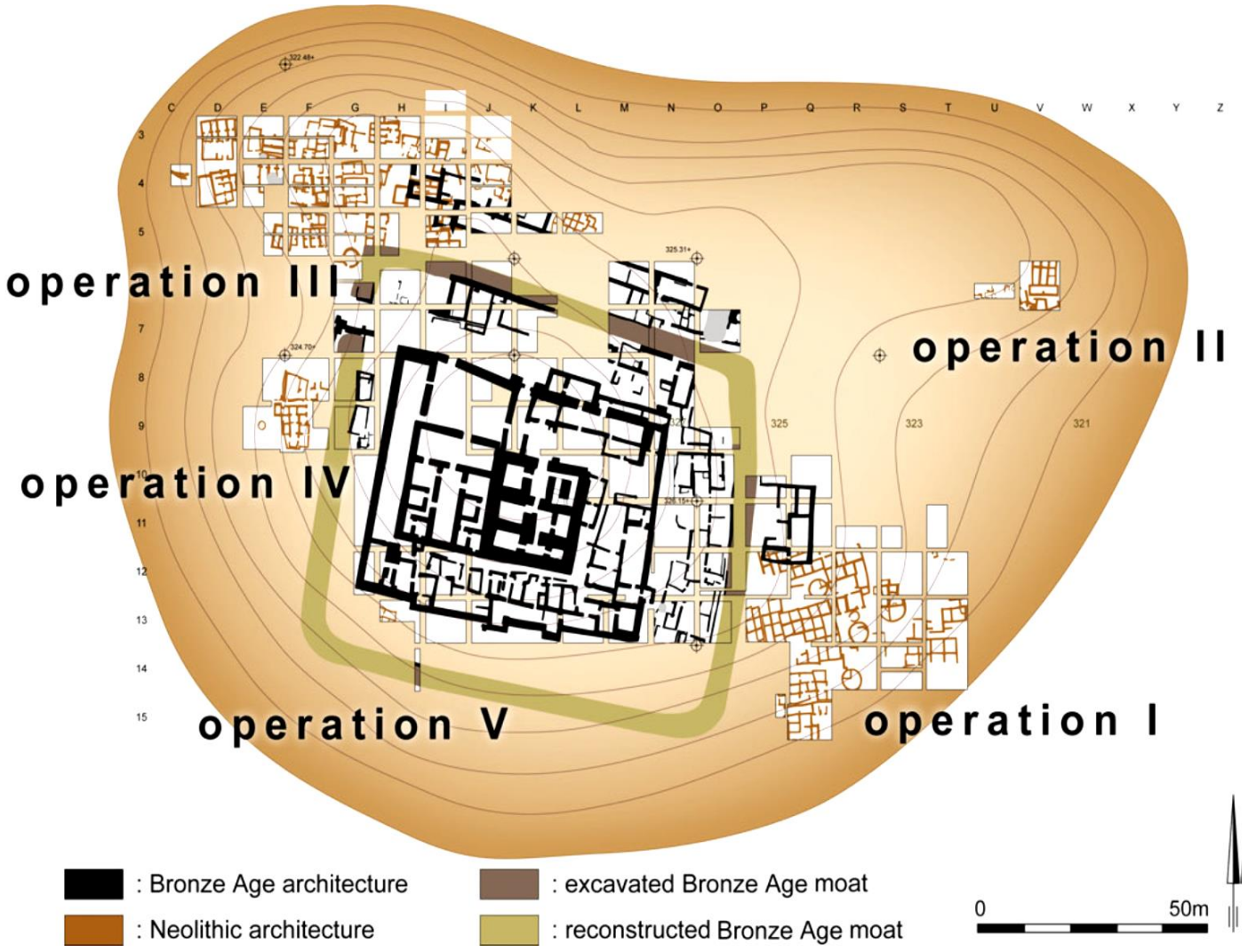


Figure 4.3-3: Detail of the main mound: Mound I at Tell Sabi Abyad with the five excavation areas or "operations" marked (Nieuwenhuyse, Akkermans & van der Plicht 2010: fig 4 p. 77).

Figure 4.3-4: Curvilinear building or "tholos" at Tell Sabi Abyad (operation I, Level 6 "Burnt Village"). Similar tholos are evidence in other areas of the site. (Akkermans 2014c).

Figure 4.3-4: Tiled mudbrick platform at Sabi Abyad III (square I7W). (Photograph: author's own).

Figure 4.3-6: (Top) PPNB tripartite building in square H7, Sabi Abyad III. **(Bottom)** PPNB tripartite building in J9, Sabi Abyad III, viewed from the northwest. The mudbrick walls can clearly be seen as can the possible stairwell or otherwise narrow storage room in the centre left. (Photographs: author's own).

Figure 4.3-7: The "Death Pit" of square J7, Sabi Abyad III. (Photograph: author's own).

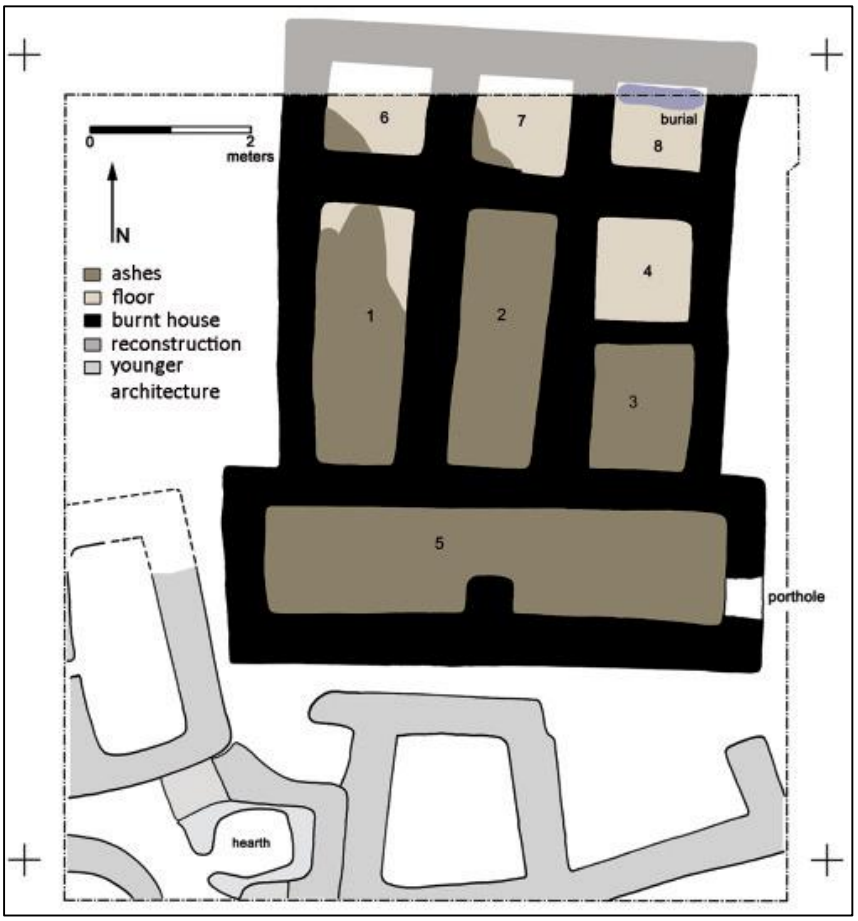


Figure 4.3-8: Excavation square V6 (operation II, Tell Sabi Abyad) showing the "T-shaped" burnt building, covering most of the excavated area. Distribution of ashes from the fire are marked (Akkermans *et al.* 2012: fig. 4 p. 312).

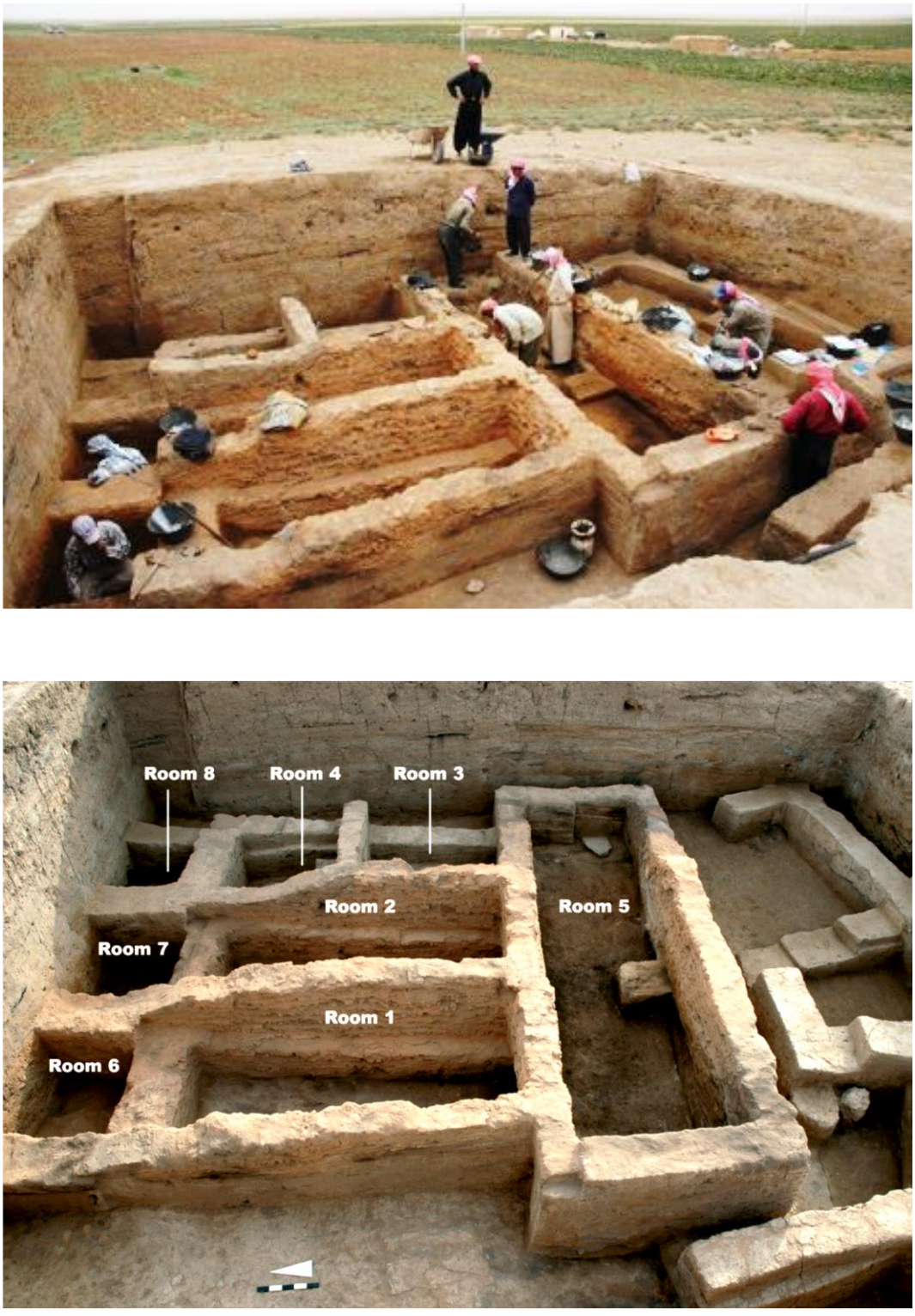


Figure 4.3-9: Building I: the T-shaped building/Burnt Building I in Square V6 (operation II, Tell Sabi Abyad). **(Top)** Building I during excavation, **(bottom)** detailing the different rooms. (Above: Tell Sabi Abyad Website, below: Akkermans *et al.* 2012: fig. 8 p. 311).

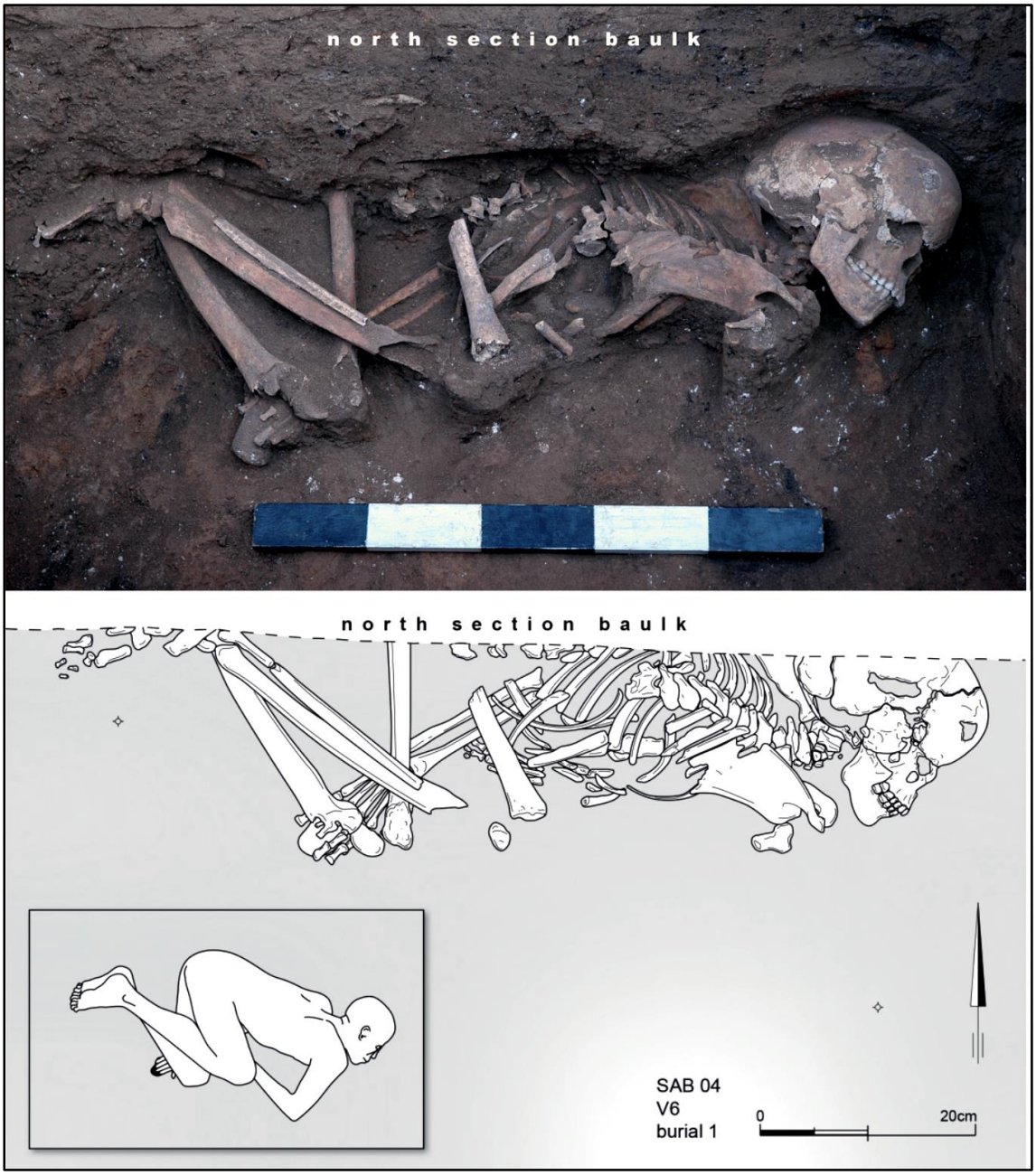


Figure 4.3-10: Burial of an adult female, placed on top of the floor of room 8, T-shaped building/burnt building I, square V6 (operation II, Tell Sabi Abyad). (Akkermans *et al.* 2012: fig. 6. p. 313).

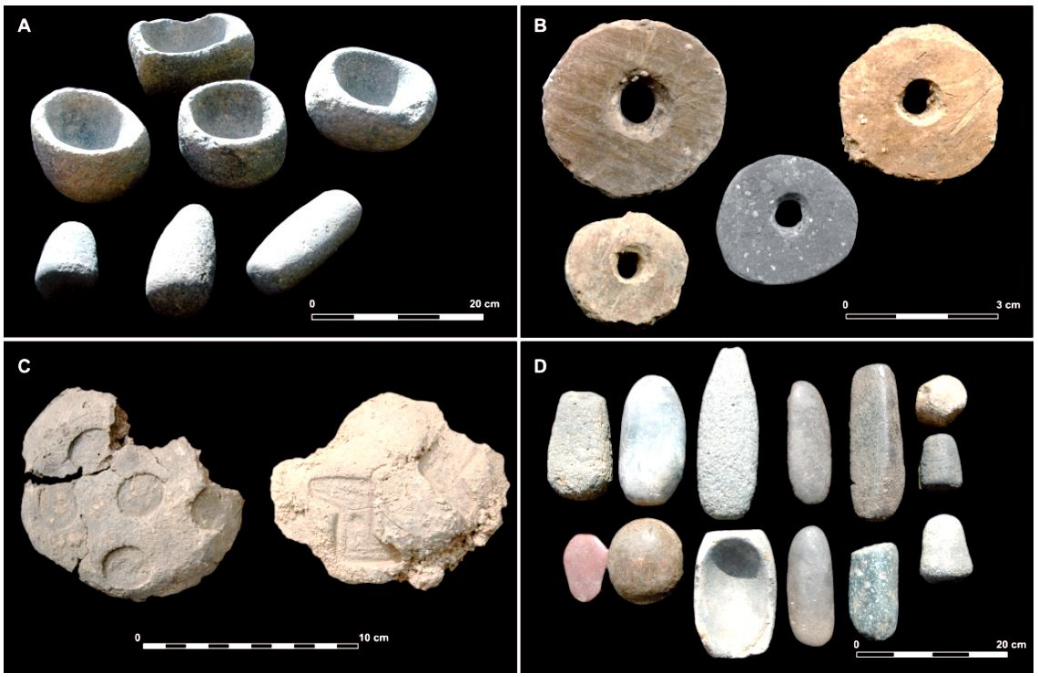


Figure 4.3-11: Range of finds uncovered from the T-shaped building/ burnt building I, square V6 (various rooms and levels, Akkermans *et al.* 2012: fig. 8 p. 315).

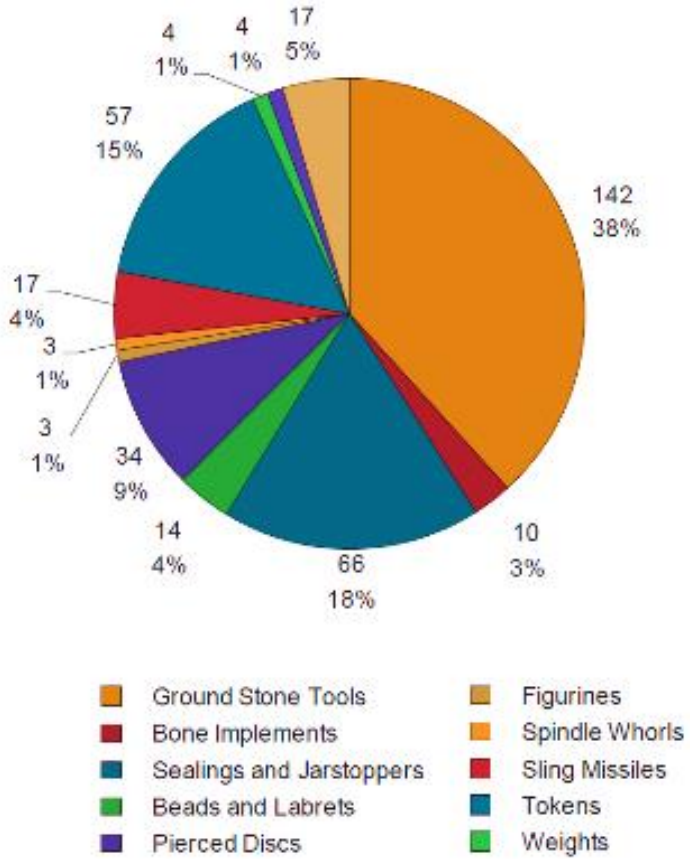


Figure 4.3-12: Range and proportion of small finds recovered from the burnt building I, V6. The four "bullae" are recorded under the "sealing" count. Also see table 4.2-2. (Akkermans *et al.* 2012: fig. 7 p. 314).

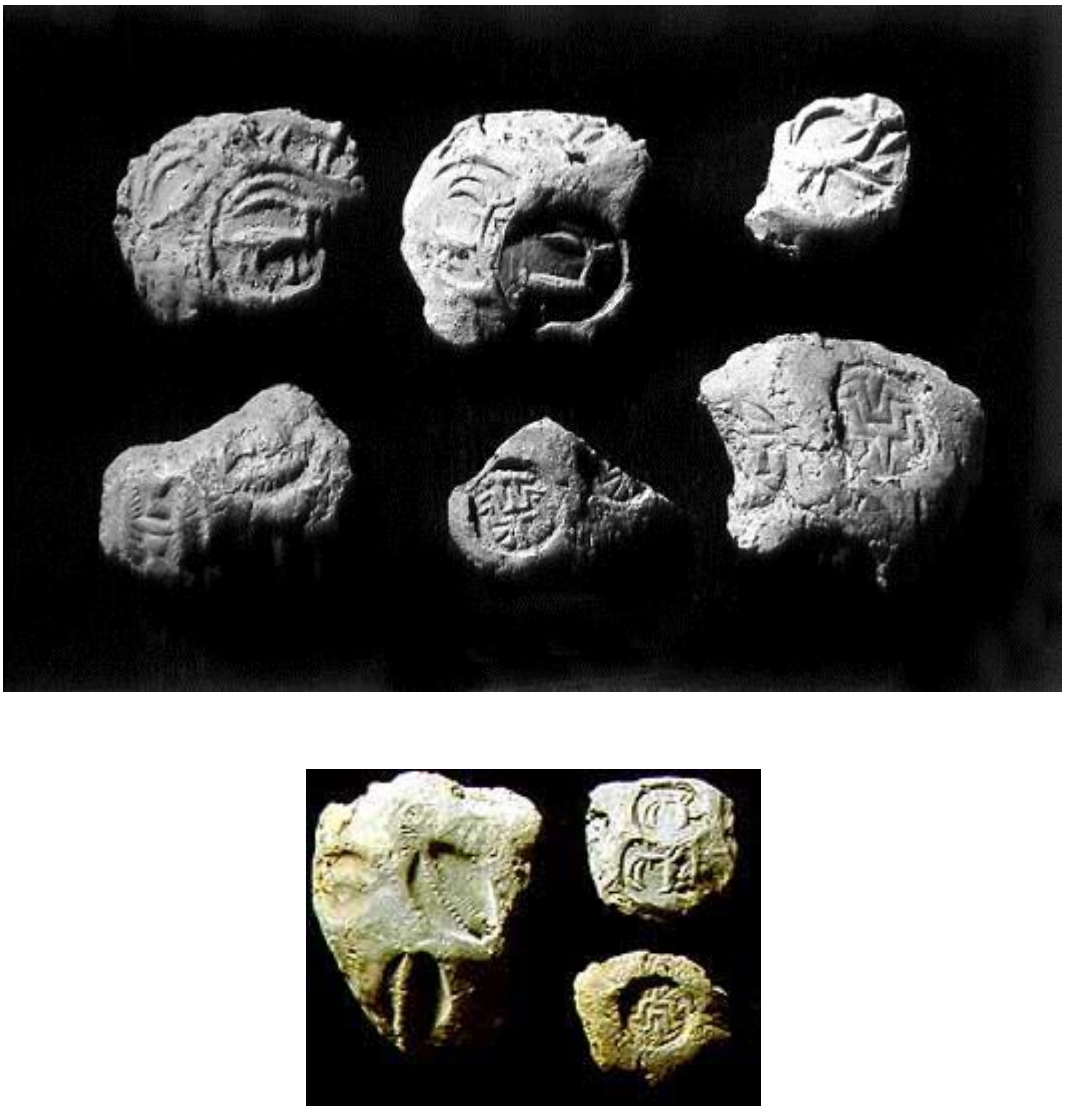


Figure 4.3-13: Selection of sealings from Level 6, showing the range of designs apparent in the stamp seal impressions (Akkermans 2014b).

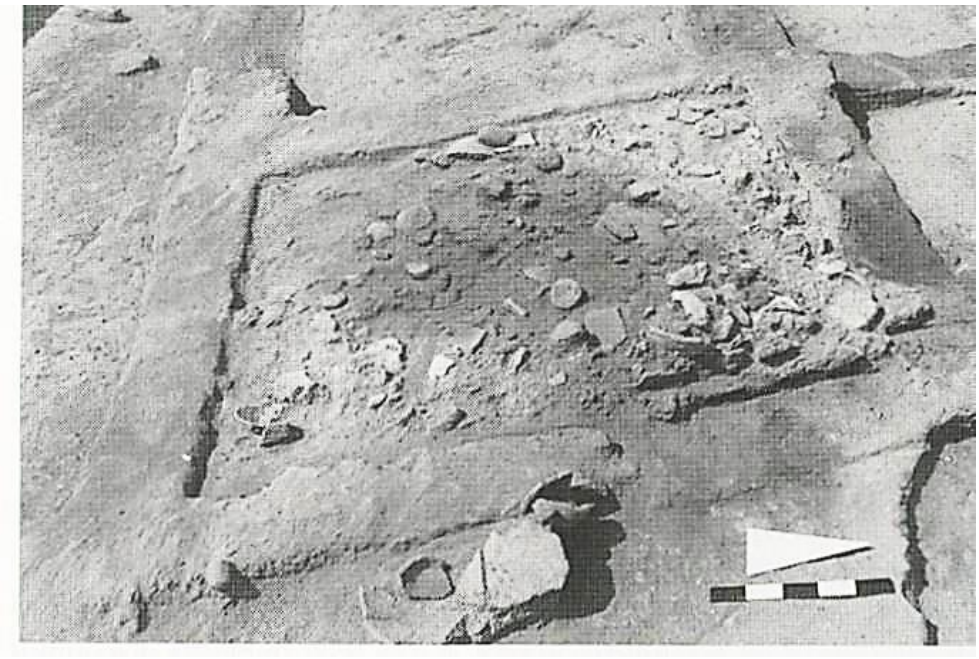


Figure 4.3-14: *In situ* finds covering the floor of building II, room 6 within the "Burnt Village" (Level 6) of operation I, Tell Sabi Abyad. (Akkermans 1996a: Fig. 2.10 p. 50).

Figure 4.3-15: Rectilinear building at operation I, Tell Sabi Abyad (the Level 6 village). Note the man in one of the central rooms, giving a perspective of the relative size of the rooms and the level of preservation of this level of occupation (Akkermans & Verhoeven 1995: 8).

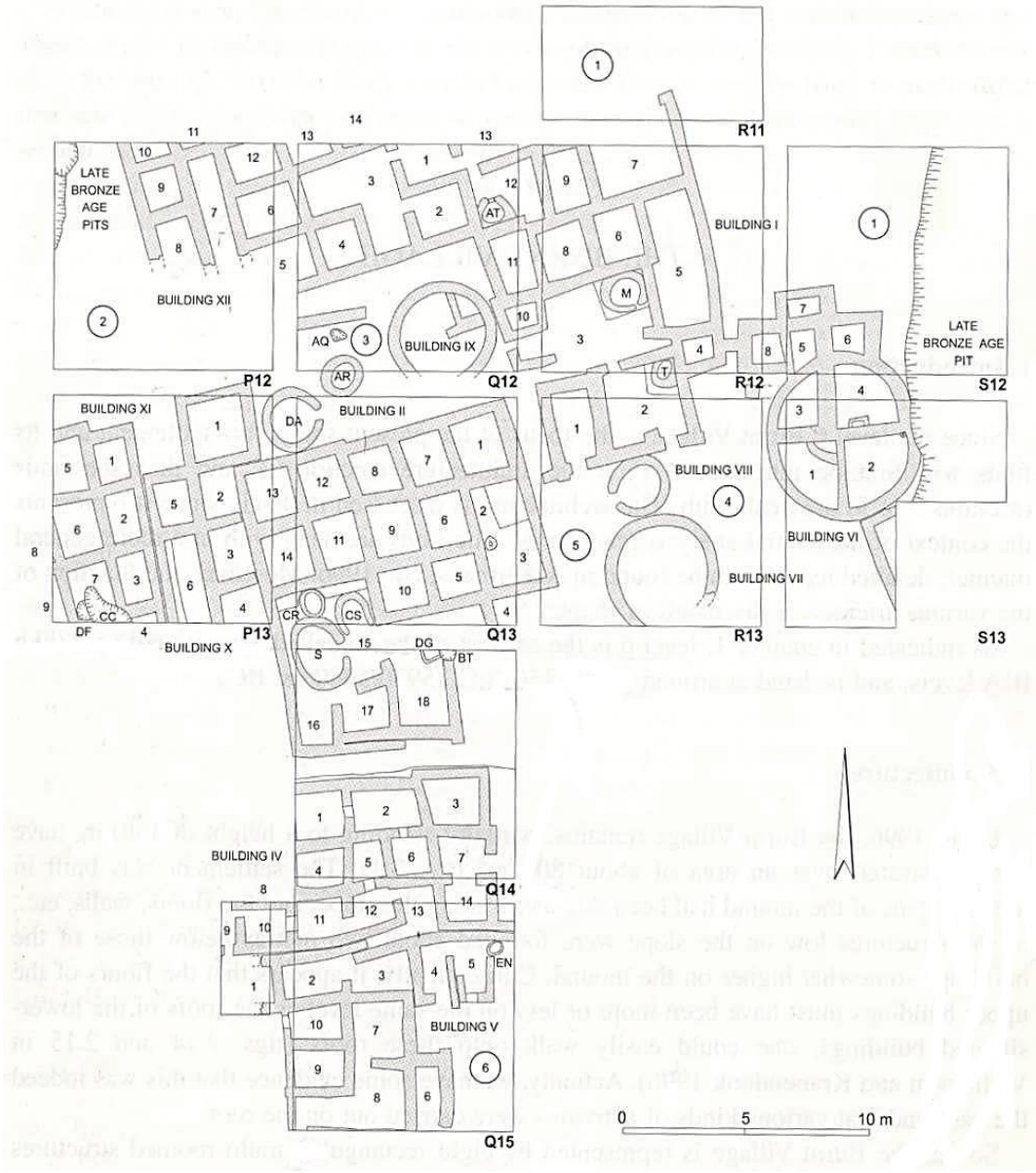


Figure 4.3-16: Plan of the Level 6 (operation I, Tell Sabi Abyad) architecture and village layout, showing the names of the buildings and rooms, excavation squares and selected ovens. (Verhoeven 1999: 26).

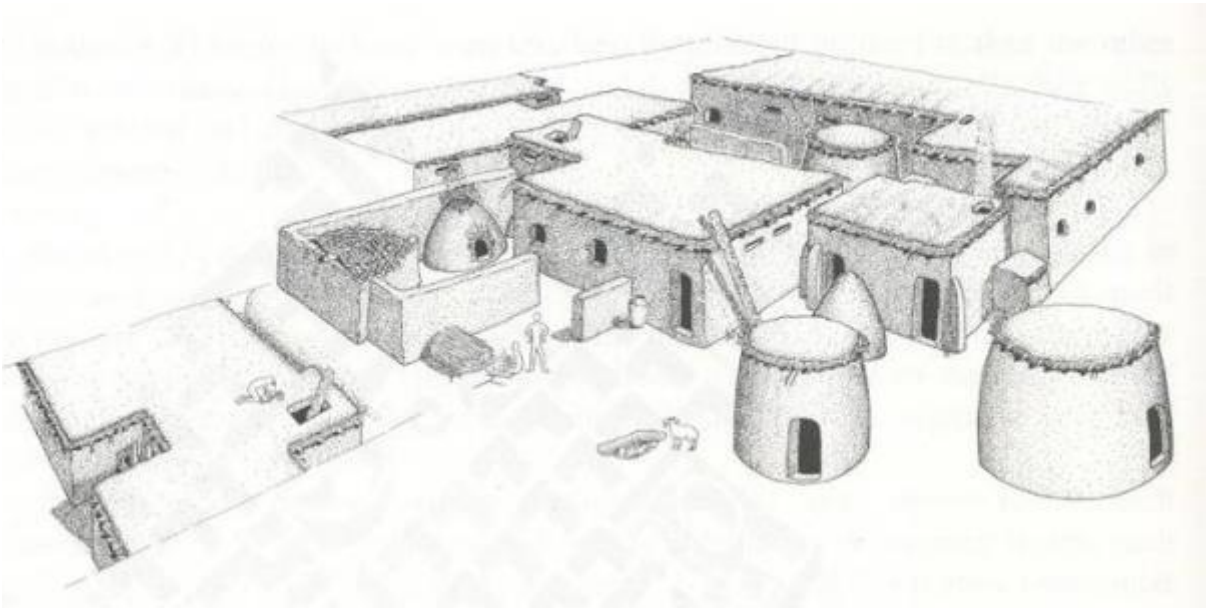


Figure 4.3-17: Artistic reconstruction of the Level 6 village (operation I, Tell Sabi Abyad) showing roof access to some rooms (Verhoeven 1999: 26).

Figure 4.3-18: Photograph of a crawl hole between rooms 5 and 12 of building IV (Level 6, operation I, Tell Sabi Abyad), viewed from the south (Verhoeven & Krandenonk 1996: 45).

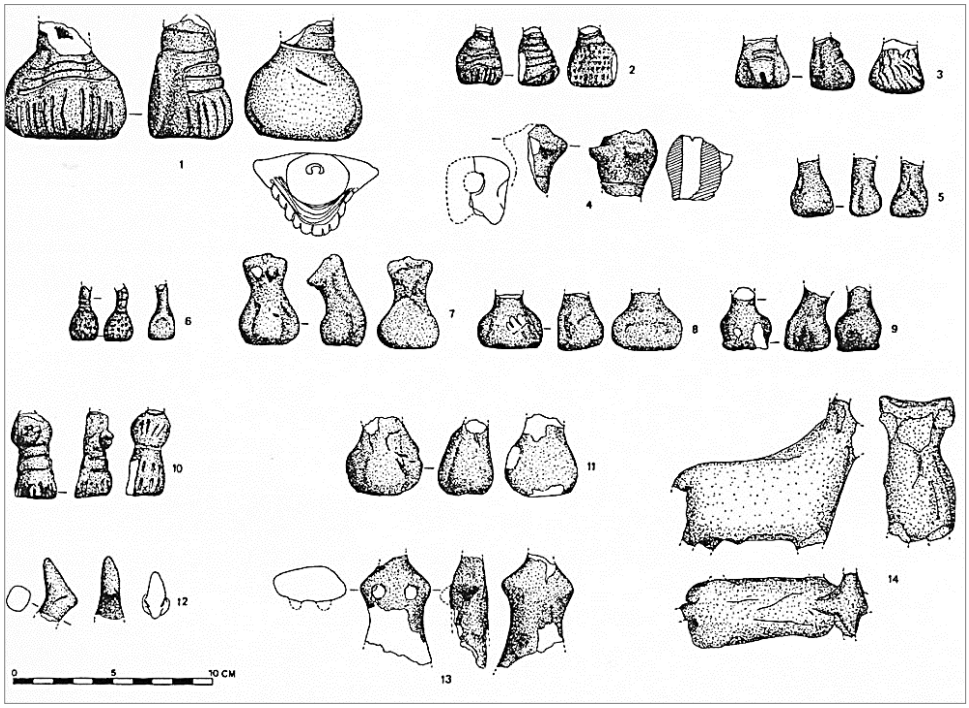


Figure 4.3-19: Anthropomorphic and zoomorphic figurines from Level 6 buildings at Tell Sabi Abyad operation I. (Akkermans & Verhoeven 1995: 25).

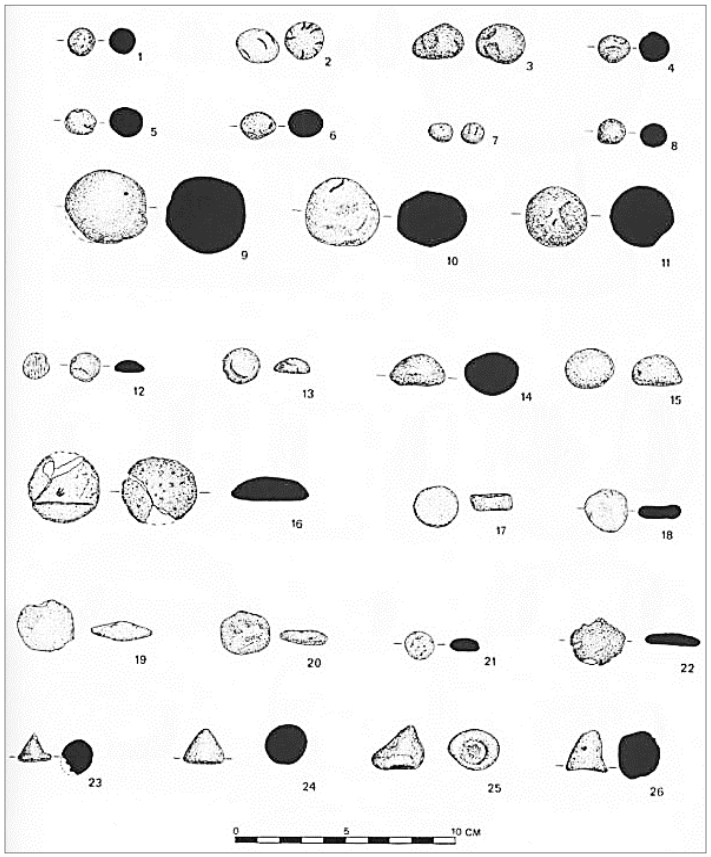


Figure 4.3-20: Selection of "clay tokens" from Level 6 buildings at Tell Sabi Abyad operation I (Spoor & Collet 1996: 465).

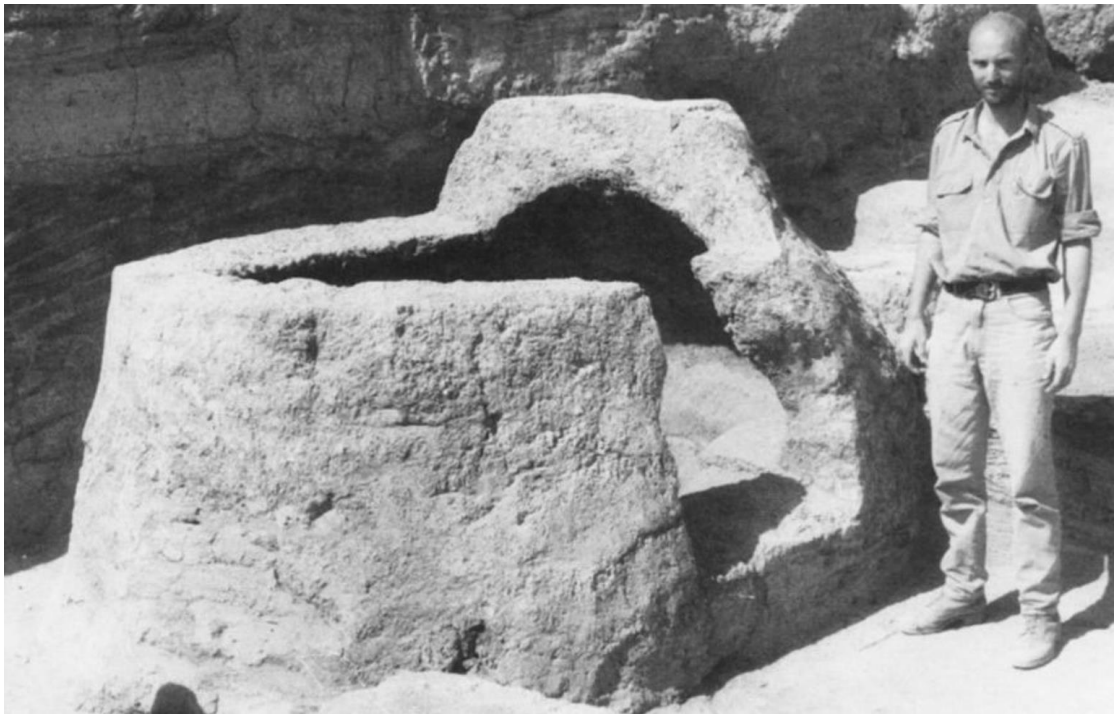


Figure 4.3-21: Oven S, from building II, Level 6 of operation I, Tell Sabi Abyad (Akkermans & Verhoeven 1995: 13)

TABLES:

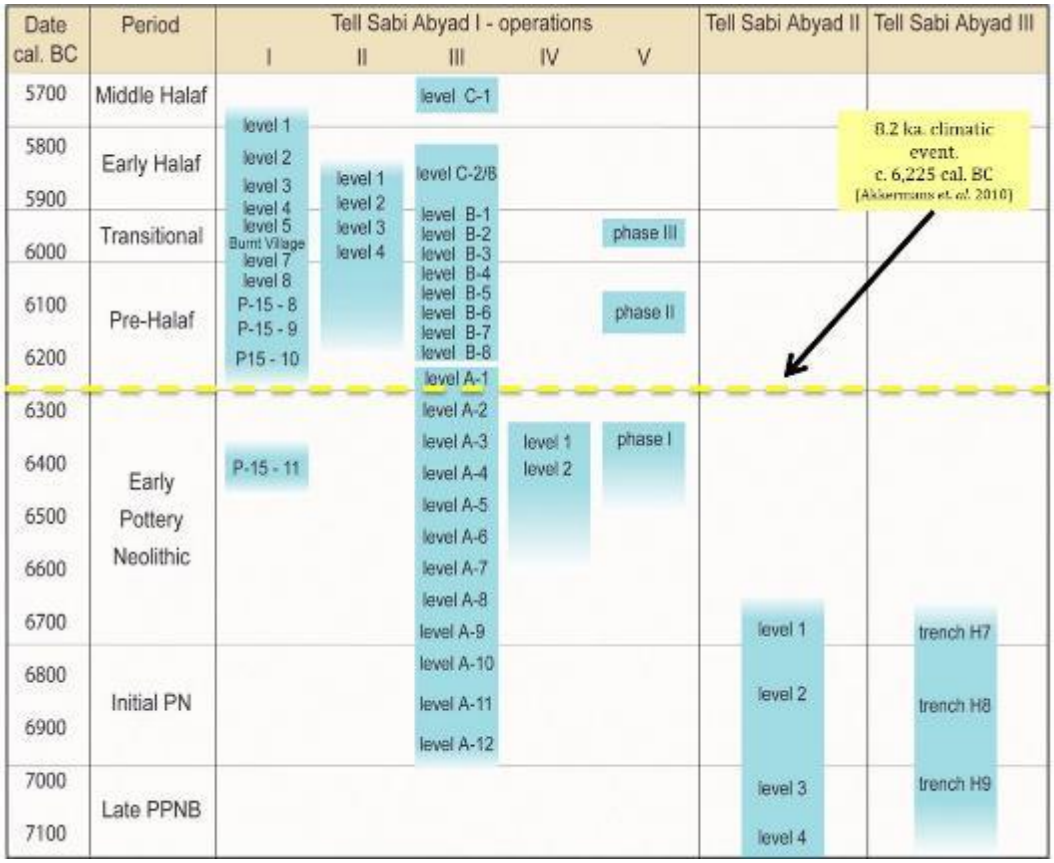


Table 4.3-1: Chronological chart detailing the sequence at Sabi Abyad across all 5 tells and the individual operations within the main mound-Sabi Abyad I (Adapted from Nieuwenhuyse, Akkermans & van der Plicht 2010: fig 5 p. 78).

	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7	Room 8	Total
Ground stone tools	53	5	36	2	45	0	0	1	142
Bone implements	3	0	3	1	3	0	0	0	10
Sealings, jar stoppers	14	0	22	0	30	0	0	0	66
Beads, labrets	5	2	0	1	2	4	0	0	14
Pierced discs	14	4	2	2	9	3	0	0	34
Figurines	2	0	1	0	0	0	0	0	3
Spindle whorls	2	1	0	0	0	0	0	0	3
Sling missiles	6	1	7	1	2	0	0	0	17
Tokens	15	0	34	3	5	0	0	0	57
Weights	2	0	0	0	2	0	0	0	4
White Ware	2	0	2	0	0	0	0	0	4
Miscellaneous	6	0	5	2	3	0	1	0	17
Total	124	13	112	12	101	7	1	1	371

Table 4.3-2: Range and proportion of small finds recovered from the burnt (T-shaped) building at Tell Sabi Abyad. The four "bullae" from room 3 are all recorded under the "sealing" count. (Akkermans *et al.* 2012: table 2 p. 317). See Chapter 8 for discussion of these objects.

container type / building		Bs	Mt	Pt4	Pt	Bg	Sv	17	18	?	–	Tt
II (room 1)	n	–	–	–	–	–	–	–	4	1	2	7
% per context	%	–	–	–	–	–	–	–	57.1	14.3	28.6	100
% of total (per container type)	%	–	–	–	–	–	–	–	80.0	2.0	25.0	2.3
II (room 6)	n	90	3	21	35	2	4	16	1	27	2	201
% per context	%	44.8	1.5	10.4	17.4	0.9	2.0	7.9	0.5	13.4	1.0	100
% of total (per container type)	%	80.3	50.0	70.0	55.5	66.7	100	80.0	20.0	55.1	25.0	67.0
II (room 7)	n	7	3	1	2	–	–	2	–	3	1	19
% per context	%	36.8	15.8	5.3	10.5	–	–	10.5	–	15.8	5.3	100
% of total (per container type)	%	6.2	50.0	3.3	3.2	–	–	10.0	–	6.1	1.3	6.3
II (room 10)	n	–	–	–	1	–	–	–	–	–	–	1
% per context	%	–	–	–	100	–	–	–	–	–	–	100
% of total (per container type)	%	–	–	–	1.6	–	–	–	–	–	–	0.3
II (all rooms)	n	97	6	22	38	2	4	18	5	31	5	228
% per context	%	42.5	2.6	9.6	16.7	0.9	1.7	7.9	2.2	13.6	2.2	100
% of total (per container type)	%	86.6	100	73.3	60.3	66.7	100	90.0	100	63.3	62.5	76.0
IV (room 12)	n	–	–	–	–	–	–	–	–	1	–	1
% per context	%	–	–	–	–	–	–	–	–	100	–	100
% of total (per container type)	%	–	–	–	–	–	–	–	–	2.0	–	0.3
V (rooms 3,10)	n	–	–	–	1	–	–	–	–	2	1	4
% per context	%	–	–	–	25.0	–	–	–	–	50.0	25.0	100
% of total (per container type)	%	–	–	–	1.6	–	–	–	–	4.1	12.5	1.3
V (room 6)	n	9	–	4	1	–	–	2	–	5	–	21
% per context	%	42.9	–	19.0	4.8	–	–	9.5	–	23.5	–	100
% of total (per container type)	%	8.0	–	13.3	1.6	–	–	10.0	–	10.2	–	7.0
V (room 7)	n	3	–	2	19	1	–	–	–	10	1	36
% per context	%	8.3	–	5.5	52.8	2.7	–	–	–	27.8	2.8	100
% of total (per container type)	%	2.7	–	6.7	30.2	33.3	–	–	–	20.4	12.5	12.0
V (all rooms)	n	12	–	6	21	1	–	2	–	17	2	61
% per context	%	19.7	–	9.8	34.4	1.6	–	3.3	–	27.9	3.8	100
% of total (per container type)	%	10.7	–	20.0	33.3	33.3	–	10.0	–	34.7	25.0	20.3
VI	n	–	–	2	3	–	–	–	–	–	1	6
% per context	%	–	–	33.3	50.0	–	–	–	–	–	16.7	100
% of total (per container type)	%	–	–	6.7	4.8	–	–	–	–	–	12.5	1.7
IX	n	1	–	–	–	–	–	–	–	–	–	1
% per context	%	100	–	–	–	–	–	–	–	–	–	100
% of total (per container type)	%	0.1	–	–	–	–	–	–	–	–	–	0.3
Uncertain provenance	n	1	–	1	1	–	–	–	–	–	–	3
TOTAL	n	112	6	30	63	3	4	20	5	49	8	300
% per context	%	37.3	2.0	10.0	21.0	1.0	1.3	6.7	1.7	16.3	2.7	100
% of total (per container type)	%	100	100	100	100	100	100	100	100	100	100	100

Table 4.3-3: Distribution of sealings in each building and room according to container type (Duistermaat 1996: 371).

CHAPTER 5: METHODOLOGY

5.1-AIMS & OBJECTIVES

The methodology employed in this study intentionally differs from previous studies, allowing for the comparison of large and complete assemblages of objects from a number of sites. The aim is to investigate and analyse assemblages from a single site in detail and to compare them to other sites within the Near East region. The only real previous attempt at this was carried out Schmandt-Besserat (1992, 1996) however, there are many matters of concern with her work (as discussed in Chapter 2, and highlighted by scholars of the Early Historic Community, Chapter 2.4a-ii). Most crucially, the inconsistent recording format for objects across the different sites makes cross-site comparisons very difficult or impossible. Contextual data is also lacking for many objects included in the study. Often the exact time period is not recorded and the format of this differs from site to site (by millennium, stratigraphic level or time period) which makes any chronological analysis of the objects and the question of changes throughout the Neolithic difficult to address.

In the same light, distinctions across regions have generally not been investigated. Large scale analysis regarding possible regional differences within a particular time frame is currently lacking, only early (Neolithic) northern sites and later (third and second millennium BC) southern sites are compared, but with little reference to the actual regional trends-the emphasis is on the time shift and corresponding change in settlement type. The methodology employed in this thesis seeks to allow for analysis to investigate these issues, taking into account an object's immediate context, the type of settlement it comes from and variations/similarities within discrete phases of the Neolithic, across settlements and regional and local trends. In particular, the lack of consideration of the context of these objects is largely ignored in previous literature, an element paramount to this work. By recording and comparing the different contexts clay objects are found in and are not found in, as well as looking for patterns in terms of form, number and associations, it is hoped a far better understanding of the possible function and range of functions of clay objects both within as across sites in the Neolithic Near East will be gained. The dominant functional interpretations of these objects have been discussed in Chapter 2. My analysis tests past theories, as well as allowing new concepts to be investigated.

Data collection was carried out in three broad categories focusing on A) the individual objects, B) the immediate context of each object with the site, C) general site characteristics. In terms of the detail of evidence and completeness of data sets

available, these have been classified into three "tiers" of information (see section 5.2 Site Selection below for full details):

Tier 1: Direct Observation Case Studies (3 sites)
Tier 2: Museum Collections and Publications (20 sites)
Tier 3: General Descriptions in Literature (56 sites)

Investigation was initially undertaken by the intensive recording of the morphology of clay objects (including shape, size and weight) as well as manufacturing methods and materials, wear and preservation. This detailed recording was carried out across a number of sites, recording as many individual objects, in as much detail as possible (achievable for tier 1 and 2 collections). The aim of recording large or complete assemblages for a number of sites was to achieve an accurate assessment of the variability of objects both within and across sites; and thus the homogeneity, or otherwise, of these assemblages. If the objects operated within a set symbolic system, then a standardised and consistent set of clay objects would be expected, with the possibility of variations within this standard system across sites and through time. This analysis also enabled other possible uses to be sought and their plausibility to be assessed. This level of recording was possible for tier 1 *(*where complete assemblages were viewed in person, along with full access to the sites contextual data) and tier 2 (where individual objects are studied and recorded, yet with varying degrees of assemblage completeness and contextual data). In addition, details relating to the immediate context of all studied objects (where possible) was gathered and analysed, considering the location of on-site use and disposal, as well as possible associated items and goods. This approach allowed for a better understanding of the use of small clay objects than a study of their form and number alone.

Thirdly, the nature of the sites from which the objects are found and not found at (including site size, the density and nature of structures, on-site subsistence activities exchange goods and routes and craft items), were all considered in order to provide a far greater understanding of the exact nature of the use of these items than a study of their form and number alone. This information was collected for the case study sites, as well more generally as part of the review chapter outlining the characteristics of the Neolithic Near East. Details of the nature of the case study sites are discussed individually (Chapter 4). The distribution of clay objects across the Neolithic Near East and possible differences in terms of their presence both temporally and spatially was investigated through a selection of well published and well excavated case study sites

where clay objects have been actively sought but are either absent or rare; thus allowing characteristics of such sites to be evaluated. The possible presence of common characteristics between sites with large numbers of clay objects, compared to those with none could then be explored. Lastly, aside from the case study sites and sites where a selection of objects was recorded from publications, a more broad survey Neolithic Near Eastern sites was undertaken. This forms the final tier of object recording: the *General Description in Literature* tier 3.

5.2- OBJECT SELECTION & DEFINITIONS: "TOKENS" & "SEALINGS"

-Overview

In order to be consistent with the selection of artefacts to be included in the study (as "tokens" are often classified by varying characteristics across different sites) a selection criteria was constructed thus defining a *clay object* or "token" for the purposes of this investigation. Not all small geometric objects could be included, nor were deemed relevant, beads for example have a clear and definite function, yet are not always readily identifiable as such. Indeed, with different archaeological teams using different methods of classification (by raw material, function or a combination) and sets of terminology, all possible relevant object categories, and even those deemed unlike to contain any relevant artefacts had to be studied in order to ascertain whether or not a site had *clay objects* or not. Furthermore, the function of an artefact is often not immediately apparent upon excavation, especially when recovered in a state of partial completion, or broken. The placing of artefacts into typological categories is to some degree, subject to human interpretation. Lastly, not all artefacts will neat neatly into a single category, regardless of how many categories there are to choose from, and how well described the categories are. The same objects could be interpreted and thus labelled as a "bead", "pendant", "token" or "gaming piece" by different people. Likewise a tall, well burnished clay artefact may be recorded by its shape as a "cone", yet also as an abstract anthropomorphic "figurine" or a "gaming piece".

In short, the studied *clay object* sample includes objects primarily of clay, but also comparable objects of plaster and stone. Objects (generally disc-shaped) crafted from pieces of re-used pot sherds (i.e. "jetons", Costello 2000, 2002. See Chapter 2). In addition, discs or other artefacts made from re-used pot-sherds are excluded. Not every single small objects could be included in this study, thus those objects made from non-malleable pottery refuse were not studied in detail. In addition, such items are

extremely rarely published or recorded on-site in any systematic way to make the culmination of numerical data related to them possible.

All artefacts defined as a *clay object* and thus studied in this thesis are (1) small (defined below) and (2) intentionally crafted into a *geometric* shape (see illustrative examples in figure 2.2). Stone objects are included only when they are similar in size and shape to comparable objects of clay. Very rare, objects of stone can be incised, and also intentionally shaped into a clear geometric form (cube, sphere or cone for example) as well as naturally occurring in such shapes. Natural, unshaped, non-geometric pebbles are not included in the study.

-Selection criteria

Clay objects included in the research were identified by an assessment of the following characteristics:

a) *Raw material*
b) *Intentionality*
c) *Shape*
d) *Preservation*
e) *Size*

a) By definition, the majority of objects studied were made from clay, however identical objects of another raw material (such as stone and plaster) were also included if present and of the same shape, size and found in association with or in similar contexts to their clay counterparts as it is likely that they were used in the same way and thus fulfilled the same role and function as the clay objects.

b) Only those objects clearly intentionally made were included in the study. Objects deemed to be naturally occurring, unshaped raw lumps of clay, or unintentionally shaped (i.e. compacted underfoot or inside plant stems, see figure 5.1 and table 5.1 below) pieces of clay were excluded. Signs of intentionality were considered to be - clearly worked, compacted clay displaying fingerprints, fingertip depressions or nail marks, along with a smooth, well finished exterior surface.

c) Only objects intentionally shaped into a recognisable geometric form, defined as "resembling or employing the simple rectilinear or curvilinear lines or figures used in geometry" (Roget's II Online Dictionary) were studied. Unlike previous "token"

Figure 5.1: Example of small clay objects *not* recorded as geometric clay objects. Top left: probable figurine fragment (horn from a zoomorphic figurine, example from Çatalhöyük); top right: naturally cylindrical shaped object (formed by naturally drying inside reed, a common plant at Boncuklu Höyük, thus these clay formations are abundant at the site); bottom: the clay has clearly been manipulated by a human hand, with fingerprints and fingertip depressions evident, Çatalhöyük. However it has *not* been intentionally formed into a recognisable geometric shape. (Photograph: author's own).

studies, naturalistic shaped items including miniature vessels (bowls, jugs and jars for example, deemed too small to function as containers) were not included in the study as objects often described as such, when viewed, are in fact often large enough to be utilised as a container or decorative vessel. As such, a clear link between their function and of geometric clay objects is not certain.

- ***"Sealings":*** In addition to geometric shaped objects, a more certain link between clay objects and sealings is known from the Late Neolithic onwards. Sealings are here defined as simple lumps of clay used to close and secure the contents of a container, or a bundle of items such as a bag, basket, ceramic vessel or roll of cloth. It may be either plain, or bear the impression of a stamp (or cylinder seal in post Neolithic periods) seal (see figure 5.2 below, and examples in Akkermans & Duistermaat 2004: 1-2, fig. 5, Duistermaat 1996: 19, 20, figs 2 & 3). This interpretative link relates to the fact that geometric clay objects and "sealings" are found together, in the

IDENTIFICATION	RECORDED?	DEFINING CHARACTERISTICS	FEATURES NOT EVIDENCED
INTENTIONALLY CRAFTED GEOMETRIC OBJECT OR SEALING	**Yes-Geometric Clay Object**	• **Small geometric object** • Generally less than 5cm maximum dimension • Either complete or broken • If broken-enough of the original shape of the object must be present to rule out the possibility of the fragment belonging to another category (i.e. definitely not a figurine, clay ball, whorl) • Must show intentionality (see below) • Clearly worked clay • Compacted clay • Often fingerprints, fingertip depression or nail marks • Smooth, well finished exterior surface	• Possible figurine, or fragment of another artefact type (see characteristics for category 3) • Larger than 5cm • Unfinished appearance • High density of plant inclusions (likely natural or structural material) • Shapeless • No clear exterior surface • Light • Not compacted • Coarse clay • Rough surface
	Yes- possible or definite sealing	• **Sealing like material** (clay pushed onto a jar opening/string/basket/bag to seal the opening leaving finger prints and impression on the outer surface and a concave underside-marked or not) • Can have a clear geometric shape or be ambiguous-as well as there is a shape and signs of have been manipulated • Must appear to have been intentionally incised or impressed • Flat disk shaped item with deep impressions on 1 or both surfaces. Often curved up on one side where object has then been removed from the flat surface when clay is still wet.	• Natural impressions • Natural markings

UN-SHAPED OR NATURALLY FORMED CLAY PIECE	**No**	• **Unfinished appearance** • Generally tiny (less than 1cm) but can be up to 4-5cm length/diameter) • Shapeless: no rounded, defined, flattened or smoothed surfaces • Light weight • Clay is not compacted • Coarse clay • Rough surface	• Moulding • Shaping • Finger prints or fingertip impressions &/or depressions • Signs of intentional human manipulation
ACCIDENTALLY OR NATURALLY SHAPED	**No**	• **Generally less than 1cm and up to 2-4cm** • **Most likely accidentally or naturally shaped** • Could be shaped by: its own weight while resting on the floor or other flat surface, being trodden into the floor, being carried on an animal's hoof • Will be partially or completely rounded or have at least one flat surface • Could be rolled (spherical or cylindrical) • Often cylindrical rods from clay being trapped inside straw or reed like plants. In this case both ends are fragmented, the shape is very regular and often has longitudinal reed in impressions (thin straight lines) on the surface • Other forms may be rounded but in a very irregular shape • Flattened and disc shaped pieces will have an irregular outline, should have an uneven surface-or otherwise flat where they have been incidentally flattened (not lenticular in shape). • Any impressions or marking should appear as natural (such as holes where organic remains have decayed or impressions from plants) • Light • Not compacted • Often a coarse, uneven, cracked surface as clay is not compacted or worked • Sometimes a rough surface	• Moulding • Shaping • Finger prints or fingertip impressions &/or depressions • Signs of intentional human manipulation • Dense • Heavy

Table 5.1: Small geometric clay object selection criteria.

same contexts at a number of sites. Clearly understanding the role of possible sealings is important in an investigation of any theory that these objects were linked within a recording system. Therefore, in order to thoroughly test the most common theory surrounding the function of clay objects-that they were utilised in administration (of any form-counting, recording or record keeping), sealings, when found at clay object yielding sites, need to be included in the study.

d) There must be enough of an object remaining to that it is clear the object was purposefully made and not natural. Also to identify it as part of a geometric object-and not a fragment of a figurine, spindle whorl, or any other type of artefact:

a. How much of the object needs to be present depends on the final shape of the object and the element of the shape that is present.

b. There is generally a need to be able to evidence a continuous and defined, shaped surface to be certain the object was once geometrically shaped and not a figurine. Therefore if for example a cylindrical shape is present but broken at both ends; it is not to be recorded as it could easily be a leg, torso, arm or tail of an anthropomorphic of zoomorphic figurine.

e) Clay objects are differentiated from other artefacts by their small size. Exactly how small an object needs to be in order to be identified as a clay object is debatable, but all objects included in the study need to be small enough to have been used as a portable artefact. This is due to the fact that most common interpretations proposed for the use of these objects (as "tokens", counting aids, gaming pieces) depend on them functioning within a group and the fact that where contexts are recorded and published, geometric objects are often found in association with other geometrics as well as other small objects such as figurines.

- Upon viewing object assemblages from a number of sites, it became clear that a recognisable group of artefacts could be differentiated from other objects by their raw material (clay) shape (geometric) as well as their common size- allowing a number to be held, carried and transported (in the palm of the hand, pocket or small container) at one time.
- These objects were found to be commonly 2-5cm (approximate largest dimension), with objects above this size significantly larger, displaying a break in the size scale rather than a gentle progression in the size of clay objects.
- As well as being significantly larger, the larger objects were often found to differ in form, style and character and thus it can be argued they functioned differently.

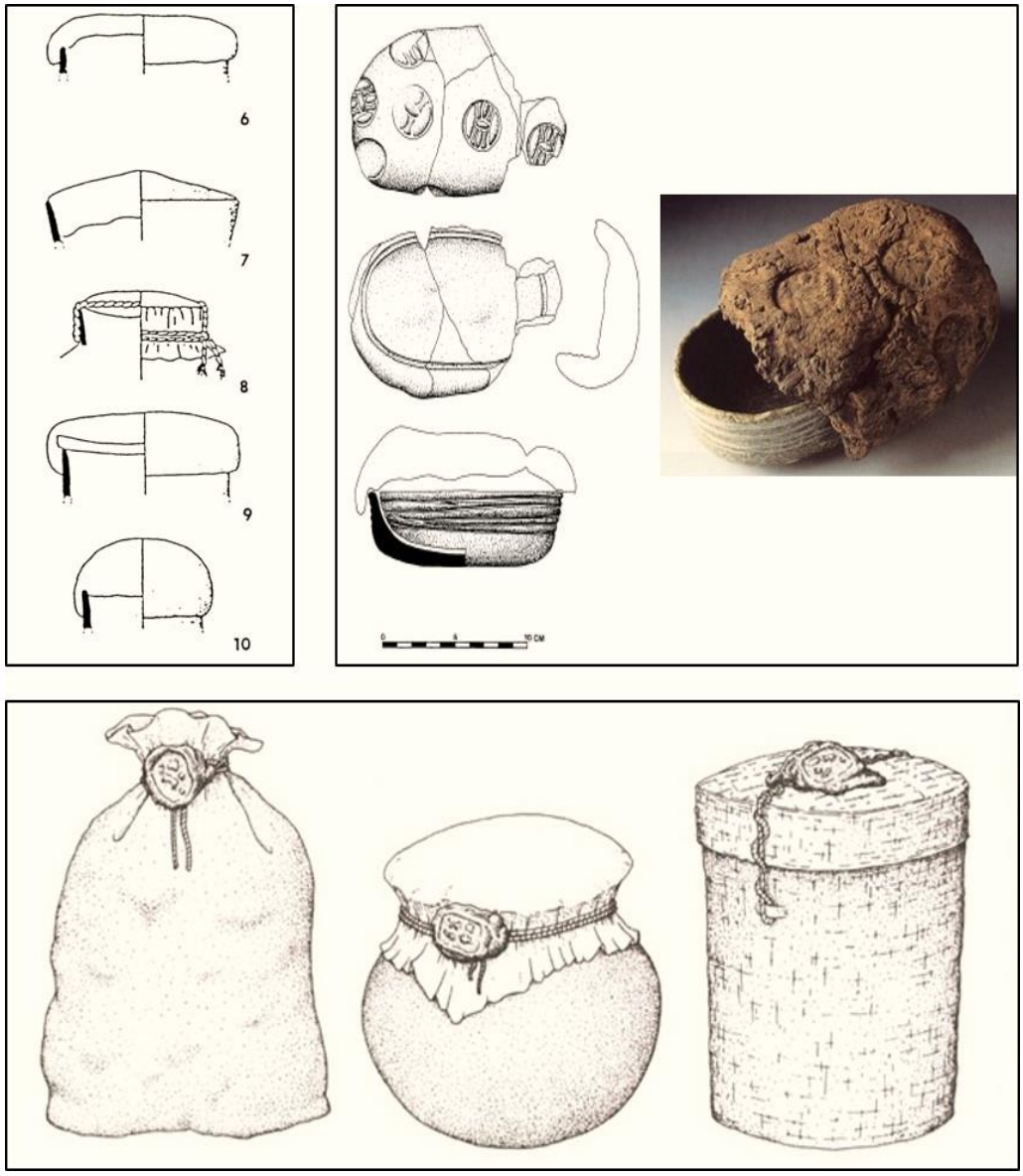


Figure 5.2: Examples of sealings, both plain and impressed with stamp seals, on different mediums. All examples are from Late Neolithic Tell Sabi Abyad: **(a)** sealings used to close or "seal" ceramic vessels (Duistermaat 1996: fig. 2 p. 21), **(b)** stamped (with a stamp seal) sealing, used to secure and mark a stone bowl/vessel (Akkermans, Verhoeven 1995: fig. 12 p. 23, Tell Sabi Abyad Excavation Website) and **(c)** stamped sealings used to secure strong ties closing bags and baskets (Tell Sabi Abyad Excavation Website).

- Therefore this thesis considers only small items-defined as having a maximum length/diameter of 5cm.
- Although this measurement is largely arbitrary, a definition was needed in order to select and exclude objects when studying large assemblages of hundreds or thousands of objects. Also, in addition to dimensions, objects were identified and

selected from assemblages carefully considering a range of criteria (see the site specific object selection section below).

- The object section criteria is briefly summarised in table 5.1 above.

5.3- SITE SELECTION & SOURCES OF EVIDENCE

(i) TIER 1: DIRECT OBSERVATION CASE STUDIES

The case study sites from which clay objects were to be recorded individually were carefully selected according to a range of criteria in order to fulfil the research aims, as well as taking into account practical considerations. A representative range of sites in terms of geographic distribution, time period, site size and site type were sought, so that any differentiation related to these features could be investigated. Sites with a sufficiently large assemblage of objects were favoured as sites with only a handful of objects would be of little use in terms of quantitative analysis. Object accessibility was another significant factor in site selection. Thus, in order to select suitable case study sites a vast amount of published material was reviewed and many site directors of current excavations were contacted.

Tier 1 Definition:

- Sites where small geometric objects were viewed, studied and recorded in person
- Access to complete assemblages
  - Allowing all objects recovered from the site to be viewed (even if too many were present to be recorded fully on the *Clay Object Database*, the opportunity to browse the entire collection to get an idea of the kinds of objects and degree of diversity within it was present. Also the objects to be recorded could be selected from the full range of excavated materials; object selection was not dictated by the interpretation and categorisation of artefacts by others).
- Either all or significant proportions of the total estimated excavated small geometric clay object count recorded per site
- Access to full contextual data
  - for each and every object individually
  - provided by the project director

(ii) TIER 2: MUSEUM COLLECTIONS & PUBLICATIONS

Additional assemblages of comparable objects from a more diverse range of sites were sought, in order to expand the *Clay Object Database* and enable comparison and examination of objects

from a wide range of sites (in terms of not only geographic and temporal distribution, but also of site characteristics such as site size and subsistence strategies). For practical reasons these objects could rarely not be recorded in person. An extensive literature review of Neolithic Near Eastern sites was undertaken in order to complete tier 2 recording. In most instances; only very small number of objects could be recorded from each site and for all; complete or near complete assemblages were not accessible.

Tier 2 Definition:

- Access to the details of individual objects, yet a fragmented record.
- a) Limited number of objects from a single site recorded in person, from a museum or other collection OR
- b) Limited number of objects from a single site recorded individually from site publications or unpublished site records using detailed object descriptions and/or illustrations
- Recorded on the *Clay Object Database* in as much detail as available, yet sometimes only the three-dimensional shape is known.

(iii) TIER 3: GENERAL DESCRIPTIONS IN LITERATURE

Tier 3 Definition:

Comprising a broad survey of the presence of clay objects in the Neolithic Near East; this category covers objects published within a "general discussion" of a site's "tokens", with no illustrations or specific description of individual objects, meaning objects cannot be individually identified and thus cannot be added to the *Clay Object Database*. Tier 3 objects are recorded per site as a group; with general data relating to the assemblage of a site as a whole, being recorded on a separate, simpler database focusing on site information (the Site Database: Appendix J). Often there is no real total of the number of these objects per site, nor a breakdown of the number or proportion of the characteristics described. Information maybe vague; a passing reference to the presence of small "token-like" objects of clay, for example. Some sites often include a combination of tier 2 and 3 data, with a small number of objects described or depicted individually in publications and in addition general characteristics of the entire assemblage from the site are also described. For tier 2 sites where passing references to additional objects were also made at tier 3 level (such as Jarmo, see records on the Clay Object Database: Appendix A and Site Database: Appendix J), the presence of additional similar or near identical, un-illustrated objects was noted in the "Additional Notes" section of the *Clay Object Database* where relevant.

SITE	NO. OBJECTS STUDIED	SOURCE	OUTPUT
Tier 1: Direct Observation Case Studies, 3 sites			
Boncuklu Höyük	672	All recorded in person: site visits	*Clay Object Database*
Çatalhöyük	677	Primarily recorded in person: site visits (n=679). 17 additional (stone) objects recorded from the site's Groundstone Database and discussion with ground stone specialist with 2 of the total of 19 stone sphere examples present for face to face study.	*Clay Object Database*
Tell Sabi Abyad	393	Primarily recorded in person: site visit (n=293). 100 additional objects recorded from unpublished site records and publications (due to postponement of excavations)	*Clay Object Database*
Tier 2: Museum Collection and Publication, 20 sites			
'Ain Ghazal	163	Primarily from publication (n=137). Additional geometrics were recorded in person at the 'Ain Ghazal finds storage depot (Yarmouk University, Amman, Jordan) with consultation of the project directors (n=26).	*Clay Object Database*
Aşıklı Höyük	5	Publication	*Clay Object D.*
Canhasan I	2	Publication	*Clay Object D.*
Çayönü	38	Publication	*Clay Object D.*
Demirköy	4	Publication	*Clay Object D.*
'Es-Sifiya, Wadi Mujib	78	Publication	*Clay Object D.*
Gesher	3	Publication	*Clay Object D.*
Hajji Firuz Tepe	28	Publication	*Clay Object D.*
Hakemi Use	5	Publication	*Clay Object D.*
Höyücek	25	Publication	*Clay Object D.*
Jarmo	620	Publication	*Clay Object D.*
Jericho	24	Publication	*Clay Object D.*
Salat Camii Yanı	15	Publication	*Clay Object D.*

Sarab	37	Publication	*Clay Object D.*
Suberde	59	Publication	*Clay Object D.*
Tell Arpachiyah	20	British Museum (London, UK) study visit	*Clay Object D.*
Tell Halaf	7	British Museum (London, UK) study visit	*Clay Object D.*
Tell Hemmeh	2	Publication	*Clay Object D.*
Tell Kurdu	11	Publication	*Clay Object D.*
Ulucak Höyük	12	Publication	*Clay Object D.*
Tier 3: General Description in Literature, 56 sites			
Various	n/a	Publications	*Site Database*

Table 5.2: Sites from which collections of small, geometric clay objects were studied: detail (by tier) of recording, method of data collection and study output.

The original purpose of the tier 3 data collection was to identify sites with collections of clay objects that could possibly be studied. In addition to published sources, many excavators were contacted to ask if they had clay objects or not, how many and if they had been extensively studied or published. The information recorded in Appendix J: Site Database is also useful, as it can be used to numerically speak about the number and/or proportions of Neolithic sites according the many variables including the presence or absence of clay objects. Though not a comprehensive list of Neolithic sites in the Near East, nor representative of sites from different regions and time periods in the Neolithic Near East in even proportions, the sites were selected in an arbitrary fashion (largely dictated by the availability of information) and therefore are representative of a range of different types of sites. Lastly, the recording of the presence or absence of small geometric objects is heavily reliant on a) the employment of excavation techniques that would identify such objects, b) the identification of them on site as artefacts (and thus their retrieval from sieves, flotation or general excavation contexts and the logging of their presence) and c) the publication of them. Table 5.2 (above) shows the sites data was collected from, the number of clay objects studied per site, the level of recording and the method of study employed.

5.4-RECORDING STRATEGY: THE CLAY OBJECT DATABASE

The key concept of the *Clay Object Database* is to create a standardised data format and terminology in order to make the types of analysis I will undertake easier. Including cross-site analysis involving individual objects, their characteristics and context. Tier 1 and Tier 2 sites/objects were individually recorded into a specially designed Access database forming the

first and main stage of data collection. The database was designed to record as many of the multiple, varying, possible aspects of each object's form, appearance, production aspects and wear as possible. Petrographic analysis of the objects was not undertaken, nor any chemical analysis of the clays as this would require extensive time and analysis, which could not be feasibly undertaken along with morphological and contextual recording of the objects. Although the additional research questions microscopic and chemical analysis can answer are insightful, the focus of the research is aimed towards understanding the function and use of clay objects and thus, only the physical characteristics, object construction and clay composition features, visible by naked eye and hand lens (x30 magnification, 21mm loupe), were recorded.

The *Clay Object Database* is divided into sections, each focusing on a specific area related to the appearance, form or use/function of the object (figure 5.3 and table 5.3 below). Questions were primarily answered with the aid of drop down menus or tick boxes rather than having free flow text, creating a standardised terminology aiding comparative analysis. None the less, the final section allows for a detailed description of each object. To complement the information held in the database, photographs and drawings were taken. Due to time constraints, not all objects were photographed or drawn, but a selection demonstrating the range of objects from a particular collection as well as the more remarkable pieces were photographed and a smaller number drawn where time permitted.

The sections of the database that are site-specific are discussed in section 5.5 (*Assemblage and Site Specific Approaches*). What follows is a list of the broad categories that make up the database. Each is discussed in detail forming a step by step guide to the *Clay Object Database*.

SECTION	INFORMATION RECORDED
A	Basic object information
B	Shape(in conjunction with illustrative typological guide)
C	Dimensions and weight
D	Markings and decoration
E	Colour, texture and finish
F	Inclusions
G	Object creation/craft
H	Condition, wear and use
I	Additional comments

Table 5.3: Recording strategy by category of information as undertaken using the *Clay Object Database.*

Figure 5.3: *The Clay Object database.* The various (coloured coded) recording categories are marked by the corresponding letter, as detailed above and in table 5.3. For full detail, see the actual database, Appendix A.

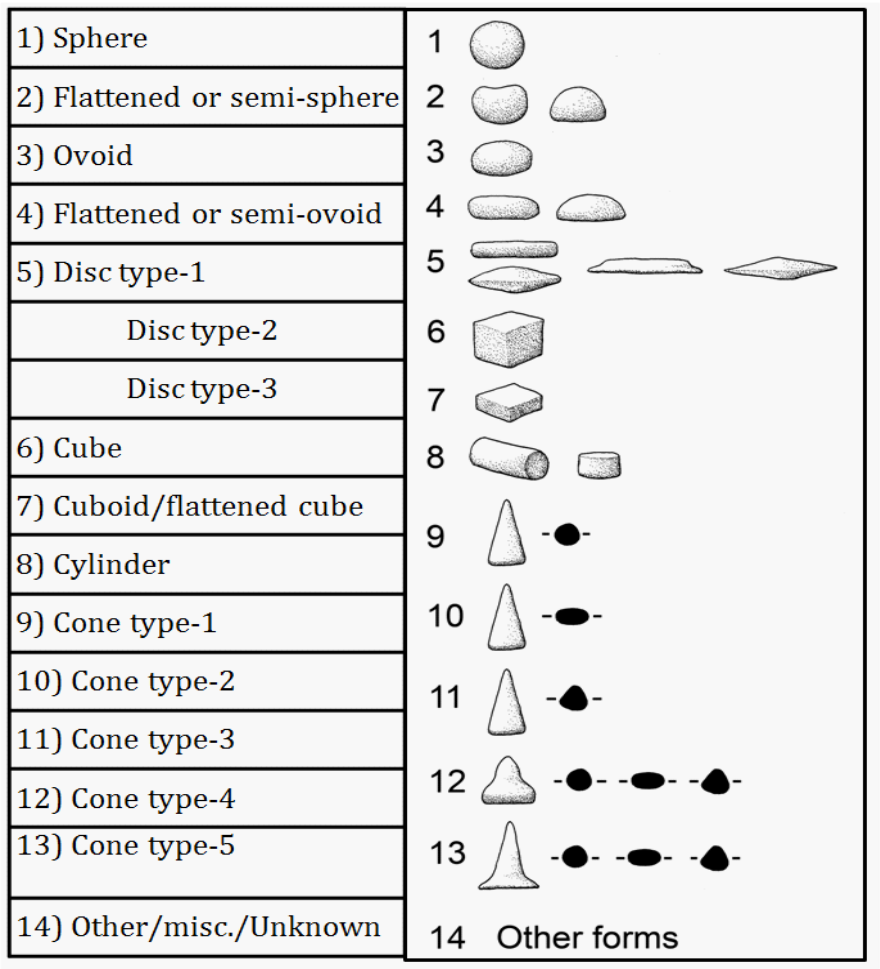


Figure 5.4: Diagram illustrating the three-dimensional shape forms (Drawings by Mesa Schumacher of the Çatalhöyük Project).

5.4(a) DATABASE SECTIONS

a - BASIC OBJECT INFORMATION

Recorded here is the basic information identifying the object, the site it comes from and the context, as well as whether the objects is complete or not and any associated illustrative records:

Clay object number **(CO#):**

- Each object is assigned a unique number (sequential, ascending from 1). Objects from a number of different sites are included in the study and each site/excavation project assigns its objects with registration numbers in a variety of formats. This can cause confusion when referring to specific objects from a number of sites. Therefore in this thesis all objects are referred to using their unique clay object number i.e. CO# 22. This makes it clear that a specific

object is being referred to and enables quick reference to appropriate the database record.

Small find/object number **(SF#):**

- Here the number assigned to the object by the excavator was logged. The format of this varies according to excavation and in some instances, there is no unique identifier and in others groups of objects are assigned a single number. In other instances objects have more than one pre-assigned identifier, such as a number assigned upon excavation and then further numbers assigned by museums or re-inventorying and re-cataloguing projects. (See below for further, site specific information in section 4).

Site:

- The name of the site which the object originates from.

Photograph/drawing:

- Whether a photograph or drawing of the object has been made.

Complete: "Yes/no"

- Whether the entire object is present or not (if an object is fragmented but all parts are present, it is recorded as complete). Similarly, if an object is damaged, even if a relatively small chip which does not distract from the original form, it is recorded as incomplete.

Degree of completeness: Drop down list: "1-24% / 25-50% / 50-74% / 75-99% / 100%"

- The percentage according to predetermined ranges, rather than the precise proportion present, is recorded for ease of comparison. This enables a general overall picture of the completeness of objects and groups of objects according to specific shapes, sites or contexts to be gathered. This percentage is thus approximate and the actual detail of the fragmentation and the effect on the object original shape are recorded in sections:

  b) ***Shape***

  e) ***Additional comments.***

<u>b</u> - SHAPE

- This section of the database allows the shape of the object to be recorded in three-dimensions, also broken down into the two-dimensional shape taken from three different viewpoints.
- Both the three and two dimensional shapes are described with reference to a pre-set typology of shapes in three-dimensions (figure 5.4 above) and two dimensions

(see figure 5.5) allowing the frequency of particular basic shape categories to be easily determined.

Three-dimensional Shape:

- This is selected from a pre-set range of 14 different shapes including a final category to be used when a) the shape is not represented by any on the pre-set list, b) the original shape is unclear, c) the object is not a three-dimensional shape (i.e. a sealing) (figure 5.4 above).

Two-Dimensional Shape:

- The three views are plan, section and longitudinal and for each of these, the same questions are asked, allowing a three-dimensional impression of the object's shape to be recorded (figure 5.5 below).
- The starting view of the object is taken from the objects natural standing position (figure 5.6 below).
- If an object does not stand unaided then is it placed on one side in the most natural position and recorded from that angle as plan view. For example, a cone with a rounded body and circular base will be recorded standing vertically if it can stand on end, or recorded laying on one side if not. Thus in the former case the view in plan will be round and in section triangular and in the latter case the plan view will be triangular.
- For each view, the shape the object is most similar to is recorded as selected from the typological guide (figures 5.5 and 5.6 below). As well as a list of possible typological forms, there is the option to select "no fit" where the shape does not clearly fit into any one particular type or "unclear" where the shape in that angle is too fragmentary to discern the original intended shape.
- Alternatively, two or three of the pre-set shapes can be selected where the shape is a combination of types and does not fit with any single form one.
- Additional questions defining the shape, alongside free text descriptions allow any variations from the basic form to be recorded.
- This combination of recording allows a clear, three-dimensional description of each object to be recorded in detail, rather than using terms such as spherical, cone or ovoid alone, as much of the detail land variations within these broader categories of shape is left unrecorded.

Basic shape:

- Selected from the typological chart. The shape that best matches the object's shape in that particular view is recorded. If an object is fragmented, then the current shape, not the original shape, is selected.

Complete shape present:

- Whether the entire shape or only part of it is present is indicated here, along with the approximate proportion of it. As stated above, the aim is to record the current shape of the object. Thus, this question allows the typological and shape descriptions to be read and interpreted with the knowledge or not that what is present and recorded may or may not be the complete and original shape of the object. This is especially useful as a fragmented object may be complete when viewed from some angles, yet far from its original form in others.

Symmetry:

- This is recorded as *perfect/near perfect/miss-shaped/asymmetrical*. This helps assess the actual shape and also the quality of craft and attention to detail. For instance an object may be square shaped, yet crudely made and thus the sides are not all of the same length or angled at ninety degrees although the main features of square shape are present and recorded as such in the "shape" section of the database.

Sides/corners:

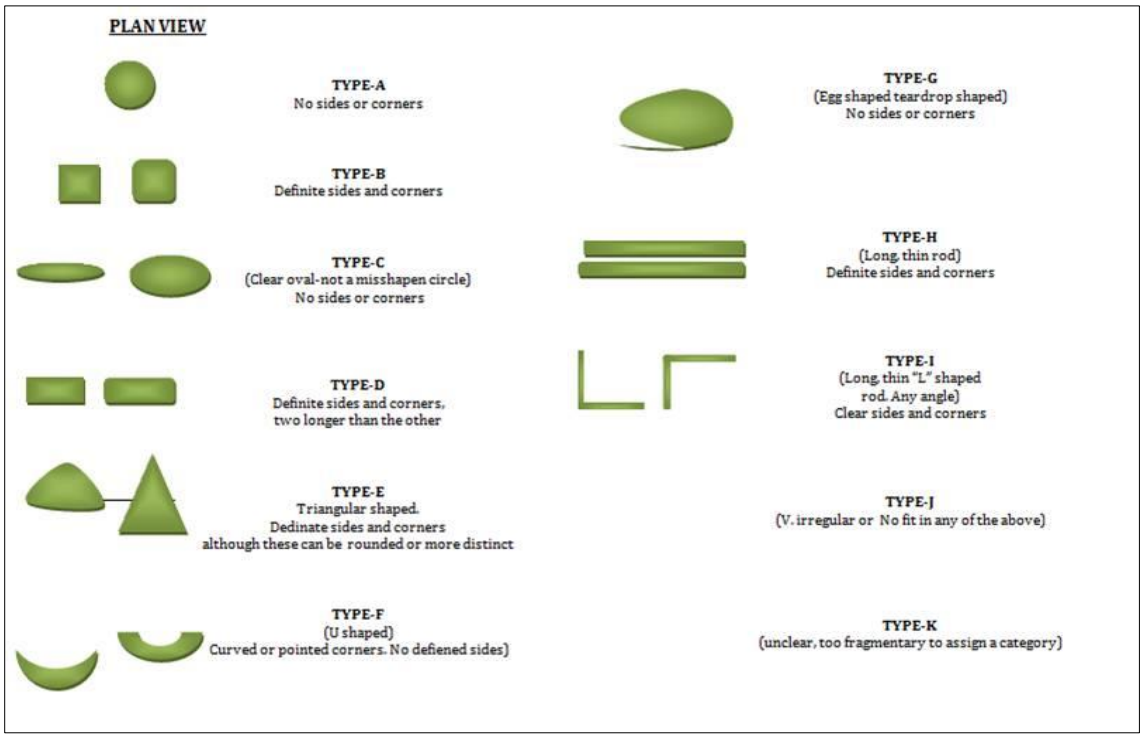
This allows the details of the shape to be reemphasised and any divergence from the expected detailed of a shape of a particular type to be highlighted. Characteristics such as a) whether the sides are straight or curved, b) whether the top and bottom surfaces are flat, convex or concave, c) whether corners are present and if they are, whether they are sharp/pointed or rounded, can all be recorded here. These then can be easily compared against other views and other shapes of the same or other type, in order to assess the degree of similarity or difference within shape categories/types and across them.

Broader at one end:

- This is a simple yes/no question again allowing for variations within a type to be logged. A rectangular shape for example (Type-D in plan view, Type-3 in longitude and section views) would suggest a "no" answer, but some may become broader at one end. Equally a triangular shape (Type-E in plan view, Type-11 in longitude and section views) would generally peak in height in the centre of the shape (as in an equilateral or isosceles triangle); however in the case of a right angled triangular shape, the object would be broader at one end.

Additional comments:

- Allows any further information relating to the shape of the object that is not recorded in the sections above, or the clarification/elaboration of any of the information already recorded to be stored.



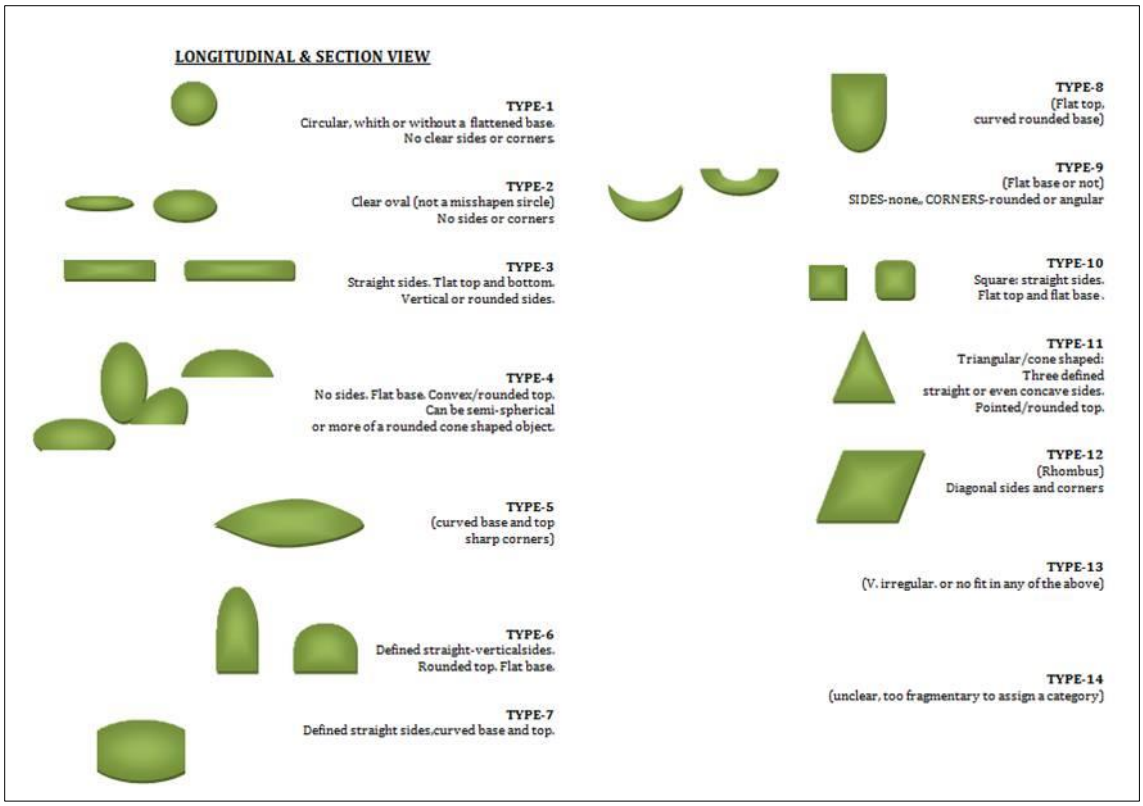


Figure 5.5: Typological chart illustrating the shapes and names the objects are classified as in each of the three views they are described in – plan view (above), section view and longitudinal view (below). One or more can be selected (where an object is a combination of two/three types). IF the shape is unclear or does not match any of the types satisfactorily then types J or K (plan view) or type 13 and 14 (longitude and section views) can be selected.

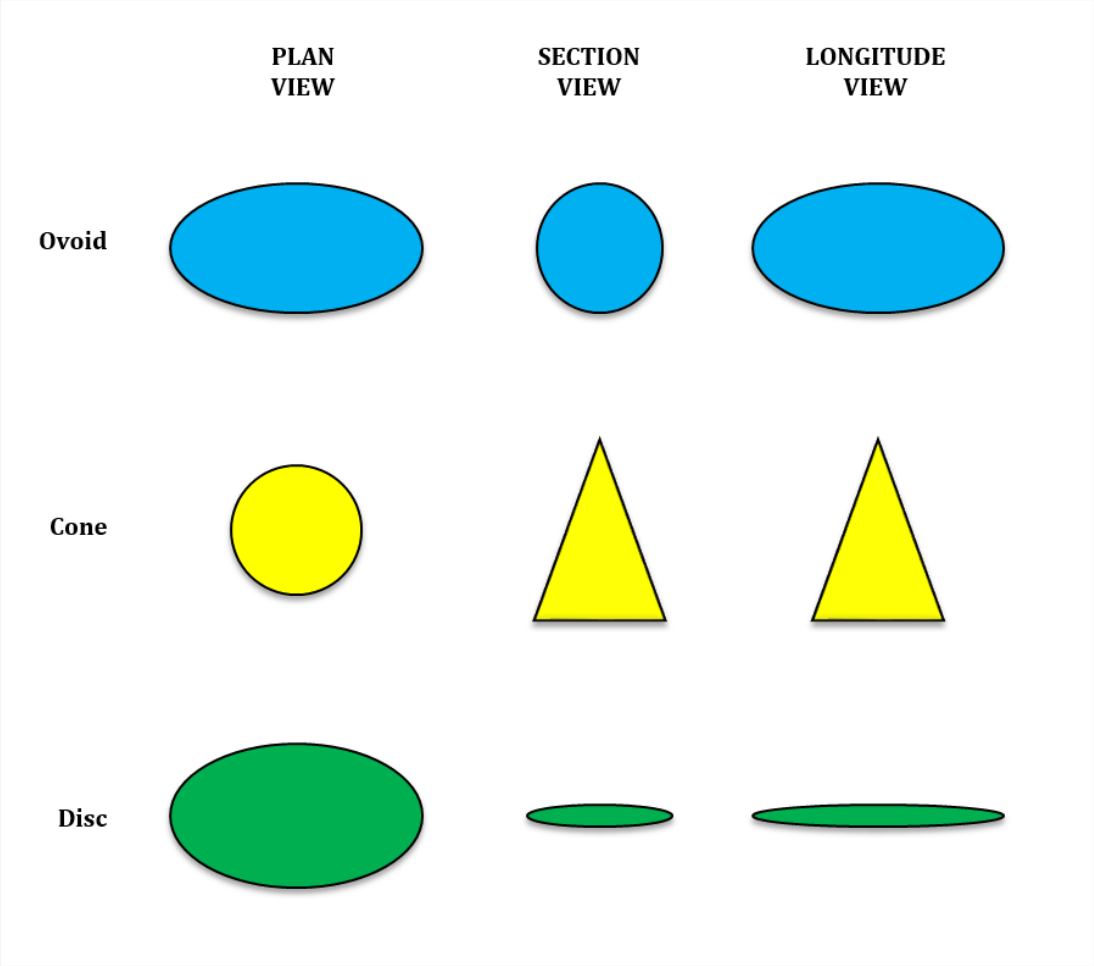


Figure 5.6: Schematic illustrative example of three different geometric shaped objects viewed from the three recording angles: viewed from: above–*plan view*, the side; as if sliced through the centre at the narrowest point-*section view* and viewed from the side as if sliced through the centre along the widest point-*longitude view.*

c - DIMENSIONS & WEIGHT

- The weights and dimensions (from various angles, see below) were recorded for all objects where possible.
- The measurements of the objects were recorded in centimetres to two decimal places.
- Weights were recorded in grams to one decimal place.
- The measurements are taken from the same three angles in which the shape of the objects are recorded, with space of additional angles to be recorded (see figure 5.7 below):

- **1: Plan view length/height**
  - Longer part of the shape in plan view (but not necessarily the longest dimension of the shape. Figure 5.7).
- **2: Plan view width/thickness**
  - Shorter side (but not necessarily the shortest) side of the shape in plan view, measured at 90 degrees to the length.
- **3: Section-longitudinal view height/thickness**
  - Height when viewed from the side.
- **4-Additional measurements**
  - Such as circumferences for curved shapes.

- In all angles, the maximum dimension was recorded unless otherwise stated in the "additional measurements" section. Here the circumference of a shape from a particular angle as well as addition angles necessitated by particular shapes only can be recorded.
- Size and weight data is useful when assessing the degree of diversity within assemblages, as well as across collections from different sites.
- Recording the dimensions as well as the shape allows the proportions of the shape to be discerned by viewing all measurements together, as well as data analysis to be undertaken including or excluding objects of a particular size etc.
- The weight is recorded as a useful alternative way to compare the size of objects, an especially important aspect of their functional interpretation and useful in assessing the degree of similarity and difference both within and across assemblages, as this may allude to differing functions of the objects within and across sites .

d - MARKINGS & DECORATION

- Any intentional markings (or those highly likely to have been intentionally made) or decorative elements of an object, as opposed to fingerprints, post-depositional chips and scratches and incidental folds in the clay are noted in this section.
- The presence or absence of intentional marking is remarked on and then the visibility of the markings and their form are described in detail:

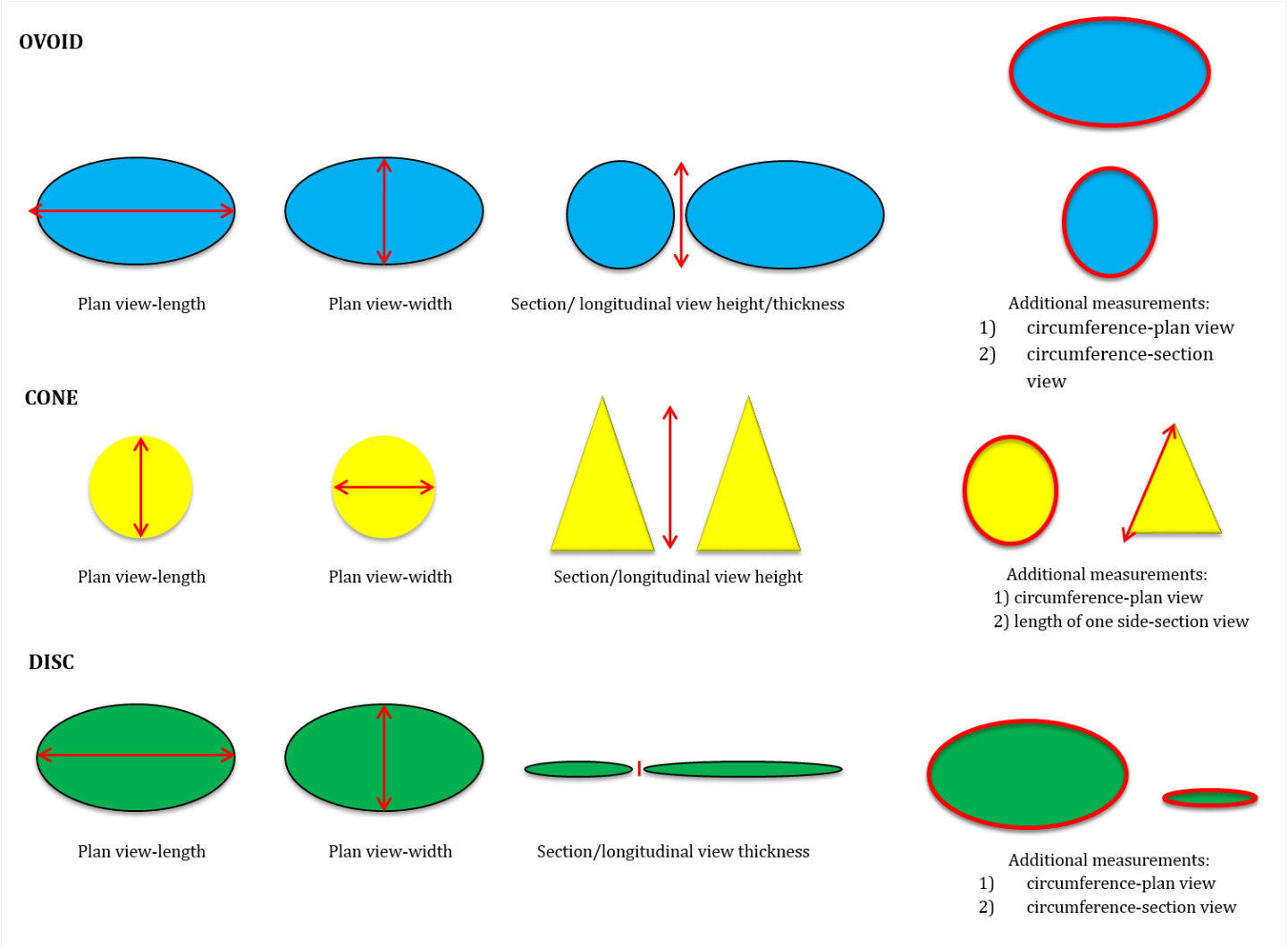


Figure 5.7: Illustrations of the same three shaped objects as the previous figure, demonstrating the angles which are measured to be recorded in the *Clay Object Database* (illustrated in red), which correspond to the viewed used to assess the shape of the object.

Coverage:

- This was recorded as a percentage grouped into: *1-24% / 25-50% / 50-74% / 75-100%.*

Location:

- This was recorded from drop down boxes: *base/top/1 side/2sides/3 sides/4 sides/unclear.*
- This enables a quick and easy comparison within and across assemblages of how much of an object is decorated and which parts of the object are decorated.

Clarity:

- The clarity and visibility of the markings was remarked on from a drop down list: *very clear/fairly clear/very faint.*
- The approximate depth of markings was also documented in centimetres.
- These records allow for the nature of the markings to be compared. Identifying how deliberate/intentional they might be; why might have been placed there initially; whether they could have been seen only when the object was closely inspected; whether they are a main feature of the object-clearly visible at a distance; would they have been clearer in the past? These judgements are all important, especially in terms of a reassessment of the interpretation of these objects as clay objects which symbolised set commodities, where the inclusion or not of additional markings and decoration it has been argued, may have altered the function of an item.

e - COLOUR, TEXTURE & FINISH

Details listed here are used to compliment the already recorded information in order to gain an overall impression of the colour, form and quality of the object. As well as to provide information to assess similarities and differences between objects.

Colour: Recorded via a list of predetermined colours, shades and combinations.

- The dominant colour of the object was recorded. If the exterior colour varies, both shades are selected and the reasons for this (for instance blackening due to possible heat treatments) are recorded in the "additional comments" section at the end of the database, as well as in other appropriate sections such as the "burning" section of the database.
- Rather than using a Munsell chart, descriptive terms are used in order to make the colours and shades more tangible than if they were in Munsell code form alone. Although this method does lead to the possibility of irregularities, the basic colours

and variations within the clays are not too divergent for the basic colours and sub-categories within them to be recorded in a satisfactorily reliable way and be easily compared against each other.

- The colour of the objects is an important consideration in terms of the function and use of the objects as specific colours may have been deliberately selected for different shaped objects, or to convey different meaning or functional uses of items and as such is a useful characteristic to record and cross reference against other object features when carrying out data analysis.

Heat Treatment:

- Whether the finish, appearance or hardness of the object suggests any heat treatment such as sun drying or light baking (excluding burning which is more obvious and thus asked as a separate question). This is difficult to discern without microscopic analysis, however, some objects do appear to have evidence of heat treatment, most commonly in the form of darkened areas.

Texture:

- Whether the general appearance and feel of the clay texture is coarse or fine is recorded. If the object is not made from clay "n/a" is selected and if the original fabric is unclear due to preservation issues for example then "unsure" can be logged.

Surface Finish:

- The original quality of finish of the object was documented. In some cases the original surface finish is unclear, but for most objects, it is visible in most places this can be seen, even if only small parts of it. *Rough/smooth/very smooth* are the options available. Generally only if the object has an exceptionally fine finish and is polished or almost polished in appearance than the last option is used.

Coated:

- Presence of a slip or other form of coating is remarked on in this section.

f - INCLUSIONS

- Those inclusions visible with a hand lens are detailed here, in order to be able to compare clay types and fabrics on a general level.
- This allows for the comparison of objects according to features such as their colour, fabric, degree of finish, clay refinement and the skill of craft. This enables an assessment of the amount of effort expended an object's creation and thus questions related to object craft, use and value to be tackled.

- Basic features such as whether mineral or organic inclusions could be seen and the frequency, colour, shape and possible identifications of them were documented here.

g - OBJECT CREATION & CRAFT

- This section as used to document details relating to the construction of the object.
- Factors such as an objects creation, markings (unintentional) and shape were remarked on.
- These characteristics are used to assess again the degree of homogeneity in terms of an object form within and across assemblages as well as functional use. In particular, the possible use of objects as sealings was logged here:

Craft:

- Whether the object was clearly rolled to create the shape, moulded onto/pressed onto a flat surface, applied to a 2 or 3 dimensional objects or sculpted. Only if evidence of such techniques was clear then these options are ticked.

Applied to*:*

Again this option was only relevant in some instances. When impressions could be seen on part of an object, or the shape hinted at a particular application, the use of the object as a sealing was considered. How likely it seems that the object was *"possibly"*, *"probably"* or *"definitely"* applied and/or used as a sealing is recorded. The evidence suggesting this is also noted, such as any impressions or shape factors suggesting the application of the object to "rope", "basketry", "vessel" or an "other/unidentified" item. Detailed remarks were made in the additional comments box.

Sealing:

- Interpretative question asking whether this evidence suggests that the object was: *maybe/possibly/definitely* used as a sealing. The type of sealing, what was sealed, how and the specific evidence leading to these claims is detailed in the "additional comments" section.

Additional comments:

- Free text to describe or elaborate on any of the markings impressions or features presented, as well as interpretive comments related to the objects use and function.

Fingerprints:

- A sub category of "object creation and craft". Here the presence of fingerprints as well as the number, distribution and percentage of the object which they cover are all recorded with the use of drop down menus. The presence, or not, of fingerprints is useful in many areas of analysis:

- Comparing fabrics and finish as some fabrics retain and/or illuminate fingerprints better than others and obviously these objects less worn and less fragmented are more likely to display fingerprints
- Discussions of craft and the quality and method of craft.

h - CONDITION, WEAR & USE

- Here features relating to the objects wear and thus factors which affect its present condition are detailed. These are useful in drawing up functional interpretations, but also in conjunction with information relating to the objects current appearance and condition as if an object has signs of heavy wear. For example, this may explain why fingerprints are not visible on the object.
- Whether the object is burnt, deliberately broken, has heavy wear or any adhering material, were all recorded from drop down menus detailing the certainty of these characteristics and the evidence that suggests them.

i - ADDITIONAL COMMENTS

This final section allows for any additional comments to be made related to any aspect of the object and was generally used for but not limited to:

- A brief, overall description of the object
- General impression of the object (i.e. how well made it was, any remarkable qualities in terms of its shape, fabric, preservation issues or decorative elements)
- Record the presence of and CO#s of similar or identical objects in the *Clay Object Database*, from the same or different sites.
- Storing additional contextual, categorisation or registration number information:
    - For example at sites where geometric clay objects are sub categorised into groupings irrelevant in this study, but a record of which is useful to check which object and proportions of which categories have been recorded
    - The storage location of the object (useful for sites where objects are stored in multiple locations such as on site and in museums, or in multiple crates or storerooms within one location)
    - Additional contextual information such as the level, tell or other identifier not recorded in or immediately evident in the "context code/identifier" but clear from other labelling accompanying the object.

5.4(b) CONTEXT RECORDING

Context information was sought for all recorded objects, so that not only the characteristics of the objects themselves, but their location on site might be studied in order to investigate possible functions. Whether context information was available and the degree of recording varied significantly from site to site and the method by which the objects were recorded.

(i) Case Study Sites

As the case study sites were all sites currently under excavation and were all visited in person, context information related to the find spot of every single recorded clay object was accessible. This enabled detailed analysis of not only the type of objects, but their location on site to be undertaken. Case-study sites were selected particularly for this reason. Though the format of context recording varied according to each site, the research aim was to electronically integrate each site's excavation database to the *Clay Object Database* in order to enable analysis of both the objects and their variability, alongside the context they were found in and all variables within in. At both Boncuklu Höyük and Çatalhöyük, detailed context records relating to each excavation unit were available electronically. This enabled (with some editing and adjusting) both site's context databases to be linked to the main *Clay Object Database* and context analysis undertaken. Unfortunately, at the data collection stage, the Tell Sabi Abyad context records only existed in paper format. Therefore a *Tell Sabi Abyad Context Database* was created, in order to record all relevant aspects of the contextual record of the objects studied from that site. This was undertaken at the Rijksmuseum van Oudheden (National Museum of Antiquities), Leiden, The Netherlands (which was, until excavations were suspended, the research base of the Tell Sabi Abyad project; housing all the Tell Sabi Abyad archives) (see Appendix E for full details).

(ii) Objects from Publications

In most cases, published objects did not have accompanying contextual information specific to individual objects. Often, site reports mention that a particular class of object was "sometimes" or "usually" found in a particular context type. Otherwise, the presence of "tokens" was noted in site reports where specific locations or features containing geometric clay object(s) were being described in detail. In a few instances, the context of a particular object or set of objects was remarked upon-noting the object(s) came from a "domestic building", "open area" or "sanctuary" for example. In a

few rare instances the context was described in detail. In these instances the context information was recorded on the object record in the "additional comments" section. In addition, in the "context code/identifier" box at the start of the database, a short reference to the context; for example the phase, level or a single word context description could be entered where appropriate. A separate context database for the recording of the context of non-case study objects was not necessary due to the infrequency of information and the sparse nature where present.

(iii) Objects from Museums

Like the published record, objects recorded from museum collections rarely came with accompanying contextual information. However, a small number of objects had limited contextual data alongside their museum record. This was recorded in the "additional comments" section of the object record.

5.5-ASSEMBLAGE & SOURCE SPECIFIC APPROACHES

PUBLISHED MATERIAL

When recording objects at tier 2 level, from published material or unpublished site records; the aim was always to record as much information as possible. Yet due to the detailed nature of the database, often many questions or entire sections had to be neglected for this tier. However, it was felt it was still worthwhile to record objects from written and illustrative accounts rather than from fieldwork alone in order to increase the number and range of sites studied, allowing greater investigation into the similarities and differences between individual objects within a single site and entire assemblages across many sites, both temporally and spatially within the Neolithic Near East. In order to distinguish objects from each other, often the small find number was recorded as the figure number in the publication or the page number where the object was described. Bibliographic reference is also recorded for each object within this tier.

VIEWED MATERIAL

Throughout the data collection process, every effort was made to ensure a consistent and regular approach to recording, both for the case study sites (tier 1) and for objects recorded from museum and other collections (tier 2). Certain elements of the database require site specific information, the format of which had to be adjusted to suit each site or museum's recording system and also differing recording systems and object categorisation systems used across the assemblages studied meant that object recognition and selection was not always straight forward. Below are site and

assemblage specific notes detailing recording methods and issues particular to specific object assemblages or site collections, covering two main topics:

- **(a)** The format of the recording of information in *section a: Basic object information*
- **(b)** Object identification and selection

5.5(a) BASIC SITE & SITE SPECIFIC INFORMATION

The exact format of the small find number and context code documentation varied across assemblages according to the different excavations and within museum collections. In some cases the exact same data and format employed at the excavation site/by the museum could be used, but in others the data needed to be adapted, or various registration numbers and context identifiers combined to form unique identifiers:

Boncuklu Höyük

- **"Context Code"**
  - This was also recorded identical to that used on site
  - **Format:**
    - A 3 digit letter system (all uppercase)
    - This gives location in 3 dimensions
    - No additional context information is needed in recording
    - The origin of all artefacts found *in-situ* as well as from sieving and flotation can be assigned to a specific context

- **"Small Find Number"** (SF#)
  - This was recorded in an identical format to the small find number assigned on site by the excavation team as:
  - The Boncuklu Höyük small find numbers are all:
    - Unique (not overlapping across trenches, contexts or seasons)
    - Generally only one number assigned per artefact
    - Assigned in the trench and not altered, updated or amended afterwards
  - **Format:** Ascending numbers from 1 onwards

TERM	REFERS TO	EXAMPLE FORMAT
Tell	• The specific mound: • "SAB" – main mound **Or** • "SAB" and trench number (in Roman numerals)	**SAB/** **SABII/** **SABIV/**
Year	• Excavation season • (Last 2 digits of year only)	**88** **09**
Square	• Trench number • 1 capital letter • 1/2 numbers	**H33,** **P2N,**
Locus	• Represents a feature (wall, oven etc.) • Format: 1-3 digit number then a dash	**1-** **54-** **133-**
Lot	• Represents a fill or deposit: floor debris, burial, oven contents etc. • Format: 1-3 digit number	**4** **67** **204**

Table 5.4: The recording format and terminology used at Tell Sabi Abyad.

Tell Sabi Abyad

- **"Context Code"**
  - The excavation utilises a number of codes relating to specific features and locations of the excavations-the tell, excavation season, trench, locus and lot.
  - The context code recorded is a combination of all of them, as individually, the identifiers are not unique.
  - Therefore, the *Clay Object Database* context code comprised all five of these identifiers in a specific sequence, in order to be able to identify the exact context of each object and link the object records to the contextual data from the site.
  - The recording format used on site is detailed in table 5.4 above.

- A complete context code on the *Clay Object Database* could be for example:
    - **"SABIII/09H33,22-67**
    - Containing the following information:
        - Tell III
        - 2009 season
        - Square H33
        - Locus 22
        - Lot 67

- **"Small Find number"**
    - Two systems are utilised by the excavation team at Sabi Abyad:

        - **1-*" Object Number"***
            - Not unique
            - Assigned in trench
            - Ascending number commencing from 1, repeated across seasons, trenches, *loci* and *lots.*
            - Must be used in conjunction with the corresponding *locus* and *lot* numbers (each are 1-3 digit numbers) to be unique

        - **2-*"Master File Number"***
            - Assigned by the finds team during finds processing
            - Is unique
            - Replaces the "Object Number" as the main object identifier once the object is processed

- The *Clay Object Database* records only the *Master File number* in the SF# box as:
    - The *locus* and lot numbers are recorded in the context code box
    - The object number alone is not unique

- **Format:** the *Master File Number* is made up of three elements and recorded (see table 5.5 below).

ELEMENT	RE*LATES TO*	*FORMAT*	*EX*AMPLE
Object Designation	• Functional or raw material based • See chart in Sabi Abyad folder to see what these stand for	• 1 capital letter	**O** **S** **F** **V**
Year	• Excavation season • Last 2 digits of year only	• 2 digit number • dash	**88-** **09-**
Unique number	• Arbitrary	3 digit number	**005** **043** **677**

Table 5.5: Sabi Abyad "Master File Number" composition breakdown. For example a stone object excavated in 1988 could be "S88-004".

Çatalhöyük

- **"Context Code"**
  - The site refers to the location of finds using a *unit number*
  - This is a 4/5 digit number, identifying the context unit/trench in three-dimensions
  - This forms the basis of the Çatalhöyük context code entered in the *Clay Object Database*
  - In addition, finds from the site are labelled with the following:
    - *Ç.H* for Çatalhöyük
    - A 4 digit excavation season/year identifier
    - The area of the site which they come from (e.g. *south*, *4040)* as this is not immediately evident via the unit number alone

  - **Format:** In order to be able to link my database to the Çatalhöyük site databases containing detailed contextual information the unit number needed to be recorded as a single 4 digit number alone, identical to that used by the excavation team and entered in the context code box of the *Clay Object Database*.

- The additional context information (as detailed above) was recorded in the additional comments section and was also incorporated into the small find number entry in some circumstances (see below).

- **"Small Find number"**
- This is recorded in various formats at the site, according to the categorisation of the find.
    - Most small finds are given a unique identifier relating to their context and object categorisation
    - A small proportion are assigned a number that relates to an objects exact co-ordinates giving it a detailed three-dimensional context (referred to as the "x-find" number)
- In all cases, the Çatalhöyük object/small find number or x-find needs to be used in conjunction with the unit number they hail from as object number or x-find numbers are a combination of a letter followed by ascending numbers, starting from 1 repeatedly across units in many cases.
    - Not all finds from Çatalhöyük are assigned individual identifiers:
        - Some are grouped under one small find number (when large caches of identical or near identical objects are retrieved from one unit for example)
        - Others are not registered with small fund numbers at all, but can be recognised by their unit number and other contextual information as well as the object category they are identified as.

    - All of these factors mean it is not possible to use one standard small find number format for the Çatalhöyük objects:

    - **Format:** the small find number in the *Clay Object Database* for Çatalhöyük objects is comprised of the following elements
        - The unit number (already used in the context code but necessary to make the small find number unique)
        - Followed by the *X* or *Find number* if present:
            - (one/two letters followed by a number i.e. "34464.X22" or "1233.MN2")

- For those objects nor assigned a small find or x number by the excavation team (and are grouped together, referred to by their designation and unit number), a small find number (unique to the group) is created as follows:

    - *Excavation season*
    - *Unit number*
    - *Area*
    - *Storage Crate code*
    - For example: **CH2006-12544-South-CO5**

British Museum Objects

- **"Context Code"**
    - Entries in this box are not strictly a context code for British Museum objects. Many of these objects have more than one number marked on them in addition to their British Museum number. Sometimes these numbers relate to contextual data and others have no known contextual information.
    - In addition to the registration number, British Museum objects often have the following numbers:
        - ***BM\Big Number***: usually a 6 digit number
        - ***Additional ID***: Most British Museum objects also have an additional ID recorded in their catalogue entry in the following format: "A." followed by 3 numbers e.g. "A.657"

    - **Format:**
    - When either of these numbers was present they were recorded on the *Clay Object Database* in the context code box, separated by a forward slash ("/").
    - Though not always related to the object context, the recording of all object identifiers enables the cross referencing of recorded objects against publication related to the site, as well as reducing the chance of recording duplicate objects (i.e. by museum visits and published objects).
    - Other formats are also found and are recorded as in the museum online catalogue.

- If neither a Big Number nor Additional ID were present, than "none" was recorded in the context code box.

- **"Small Find number" (SF#)**
  - This was recorded in the clay objects database in exactly the same format as in the *British Museum Registration number* in all cases.
  - The format of this varied from site to site, sometimes within a site across different campaigns of excavation, but generally began with the excavation year/season followed by a number.
  - Objects stored in the British Museum often had additional identification numbers to the *British Museum Registration number*. This was not recorded in the SF box of the database but in the "additional comments" section of the database and/or incorporated into the context code (see below).

5.5(b) Clay Object Identification & Selection

As well as variation in the recording of basic information, the method of identification of "tokens" and selection of objects to record varied. Aside from the obvious differences in the processing and storage of small finds; the incongruous nature of the objects meant that different excavators, sites and museums often had different ways of recognising, categorising and naming their small geometric shaped clay objects or "tokens". This was clear from the onset of the project, as publications refer to what appears to be very similar or even identical objects with various different terms, or otherwise group all of their " miscellaneous" or objects of unclear function together in one group containing a number of unrelated (in terms of function, shape, size, raw material). In some circumstances this was found to be the case, even within a single site.

It would be unreliable on each site visit to ask to view and record only those objects designated "tokens" at each site. Many sites would have objects fitting my description of "tokens" yet call them something different, or otherwise collect them but do not register them as they are unclear of their function, leaving them labelled as "miscellaneous clay objects" or something similar. Also, at many sites where various seasons of work had been carried out, often these unremarkable objects were recorded as "tokens" in one season and then as "misc. clay" for example by another finds officer

the next season, creating a situation where alike objects held a range different designations.

Each collection was approached individually with the finds registration and classification system used within that collection studied carefully. In some cases, especially where there were smaller collections of finds, a range of all of the possibly relevant objects were initially browsed and thus those relevant selected from them and recorded in full. In other cases, with thousands of artefacts in their collection as study of the terminology used to classify small finds had to be undertaken and then a representative range of all possible relevant objects viewed in order to identify which objects and categories of object needed to be retrieved from the depot or storage facility to be further browsed and select object then be recorded. The definition of "tokens" or geometric clay objects as used in this thesis has already been detailed at the start of this chapter. What follows is a brief assemblage by assemblage description of the object selection criteria employed at each site/museum collection visited.

Boncuklu Höyük

The selection of relevant artefacts to record from the Boncuklu Höyük collection was relatively straightforward. When the first provisional season of clay object recording commenced (in 2009), the site was only in its fourth year of excavation. The designation and registration of all small finds had been consistent due to such a short period of time and the fact only one person- the director (Baird) had discussed assigning object categorisations with specialists or assigned them himself.

All of the small clay objects were registered as "clay objects". There was little scope for incorrect designation as few other objects in clay were recovered from the site (a number of beads were recovered, though these were mostly identical, tiny and very distinct in shape. A small number of figurine fragments were also identified, again these were easily recognisable). However, a very small number of the "objects" were found to be pieces of floor/wall plaster or naturally occurring clay rods. Many of these rods had been collected in the first two years of excavation and registered in groups as they were often found or individually. However, it was decided in the fourth season of work that these were definitely not intentionally made, but the result of the accumulation of clay and compacted earth inside reeds and other long, thin plant stems thus no more of these items were collected or registered.

Çatalhöyük

The site of Çatalhöyük highlights the wider problems of artefact classification, terminology and designation in archaeology as a discipline. Having reviewed a selection of artefacts from a number of object categories and classifications and discussed the recording and designation policy with numerous team members, it was clear that objects fitting my criteria were designated and registered across a number of object categories at the site. Furthermore, within those relevant categories were objects which did not fulfil my criteria and thus were not to be recorded. Most, but not all, of the objects had been recorded onto a database. Objects across the three main categories had different database, therefore, the objects could not be selected merely on descriptions alone. Therefore, objects from those relevant classifications, categories and sub-categories all had to be viewed and those fitting my clay object description recorded onto the database, making the overall recording process time consuming due to the vast number of objects retrieved and stored at the site over the many excavation seasons.

Objects fitting my definition of geometric clay objects were found in the following categorisations and designations/databases:

1 – Designation: "**Figurines"**

- As recorded on the *Figurine Database*
- A number of sub-categories, most often:
    - "conical"
    - "golf tees"
    - "geometric"

- Almost all objects in these sub-categories were complete or near complete (i.e. the tip is broken off only) as these objects are conical, cone or pyramid shaped thus small geometric clay objects.

2 – Designation: **"Clay Balls"**

- As recorded on the *Clay Objects Database*
- Relevant sub-categories:
    - "mini balls"
        - small, spherical balls, flattened spheres and other rounded geometrics
        - The small (many are "token" sized, others are much larger) "cones"

        - (Some are actually small fragments of the large clay balls and are not "mini balls" or small geometric clay objects. These were not recorded).
    - "flat"
        - These objects are completely flat, disc shaped as opposed to the flattened spheres slightly flattened between two fingers/finger and thumb

3 – Designation: **"Shaped Clay" & "Clay Objects"**

- These objects are not individually numbered; they are registered in groups by the unit only, with no descriptive recording, only their presence within an excavation unit.
- Objects within this designation varied considerably in from.
- Many examples were natural and others did not appear to have been intentionally shaped
- Larger objects were also stored in this category including pot stands, mud-bricks and large fragments of structural material

Tell Sabi Abyad

The Sabi Abyad finds database includes many thousands of objects from the numerous seasons of extensive work carried out at the site. From the Neolithic levels, objects of clay are very frequent and objects catalogued as "tokens", "seals" and "sealings" are abundant. However in addition to these categories, upon browsing a selection of objects it was clear many other object categories were also found to contain small, geometric clay objects. Artefacts from the site are categorised with the following terminology (the list below refers only to those categories that upon study, included at least a small proportion of objects that would come under the classification of clay object for the purposes of this study):

a. "token"
b. "spindles whorls"
c. "pierced discs"
d. "sealing"
e. "labret"
f. "disc" and "pierced disc"
g. "jar plug"

h. “pendant”
i. “sling missile”
j. “figurine”
k. “other clay”
l. “stone”
m. “bead” (includes stone and clay items)
n. “gaming piece
o. “lump of clay”
p. “disc”
q. “pierced disc”

Before commencing recording, a selection of objects from a range of artefact categories (listed above) were studied in order to check the consistency of the sites object categorisation system and also to discern which artefact categories (or selections of objects from them) were to be retrieved for recording. In addition to clay objects comparable, small objects of stone were also considered (these were generally classified under the raw material “stone” rather than given a functional categorisation like the clay objects). From this review, the main defining features and characteristics of each category became clear and thus certain categories could be excluded, others contained almost wholly relevant objects and some categories contained assemblages where only some of the objects would could be considered as “clay objects and thus recorded on the database. However, like Çatalhöyük, the many excavation seasons and larger numbers of people participating in excavations and involved in the designation objects meant that inconsistencies in the functional designation of objects were found. Also, as with any large assemblage of artefacts, there are problems with assigning all objects into neat object classifications using terms such as “figurine”, “cone”, “disc”, “gaming piece” and so on. Some categories contained high proportion of objects suitable for this study, others only one or two examples. Some contained none. The terms “Disc” and “pierced disc” for example were consistently used to refer to discs made from ground down pottery sherds. Commonly pierced in the centre with a hole less than 0.5cm diameter, they average 3.00 to 4.00cm in diameter, with a maximum thickness of 1.00cm. Common in the Ceramic Neolithic levels, these objects were interpreted (by the Tell Sabi Abyad team) as lids for covering vessels and other containers, and also as possible spindle whorls. This category was studied, yet excluded for detailed recording and inclusion in the clay object database as the discs and pierced discs are significantly different in appearance to other small clay objects from the site. .

Likewise, almost all "miniature vessel" were small vessels capable of being used as such (to hold perfume, oil or kohl for example), rather than miniature, decorative and non-functional representations of the larger objects they imitated.

Due to the large number of objects from Sabi Abyad and the storage arrangements of the artefacts (in a separate location form both site, dig house and local museum), all excavated artefacts could not be studied. Instead, all finds from the current (2010) excavation season were viewed and those relevant were recorded. Additionally, a limited number of boxes of artefacts were selected to be retrieved from the depot. All clay artefacts within these boxes were then viewed and these fitting the criteria and those recorded (see Appendix C for further details of the Tell Sabi Abyad methodology). Due to political events beyond the control of the excavation team from early 2011 and ongoing resulted in the cancellation of the 2011 and subsequent excavation seasons. Therefore additional objects had to be recorded at tier 2 level from unpublished site records and publications.

The British Museum-Tell Halaf & Tell Arpachiyah

From reading the site reports of excavations at Tell Halaf and Tell Arpachiyah, it was evident that some of the geometric clay objects from the late Neolithic/Halaf levels at both sites were stored in the British Museum. Study objects were provisionally selected via the museum's online database, containing the records of all of the objects housed in the museum's collections. Searching the records specifically relating to each of these two sites, plus those of other specific Neolithic Near Eastern sites, records relating to objects catalogued as "clay tokens" as well as relevant (like) stone items, clay and stone stamp seals and a selection of other relevant objects including those described as "gaming piece", "sealings", "net sinkers", "net weights" and "miniature vessels", "toy", "dish", "bowl" were scanned and selected for viewing and study.

At the museum, all of the small, geometric clay objects were recorded in the *Clay Object Database*. These were generally all of a similar size and so could be immediately separated from larger objects not fulfilling the object selection criteria. Larger objects were not recorded as a different functional use of these is suggested by a significant deviation in size and/or shape. The only exception to this rule was the one larger object from Tell Halaf (CO# 878. SF#/BM Reg. no. 1920, 1211.414). This object was far larger than the other geometric objects from Arpachiyah and Tell Halaf; all of were remarkably similar in shape, size, fabric and craft (see the next chapter). Yet CO# 878

was still recorded as aside from its larger size, the object was almost identical to the other objects in the British Museum's Tell Halaf and Arpachiyah "token" collection. A number of objects from the collection, designated as "miniature vessels" were viewed, as from the catalogue it was not clear how small they were and also such objects are included as "tokens" by Schmandt-Besserat, forming one of her "types". However, all of the vessels were significantly larger than the clay objects and as such were not recorded. Far from possibly having had a similar or identical function to the clay geometrics; it was felt the objects were large enough to have functioned as vessels in their own right. Indeed one from Tell Arpachiyah does contain an unidentified substance (see figure 5.8).

Figure 5.8: Examples of objects classified by the Tell Arpachiyah excavation team as "miniature vessels". As evidenced by these examples, the objects are vessels in their own right. Note object no. 1934,0210.319 top right contains a miscellaneous substance-further supporting the notion that the object was used as a vessel, not merely as a "token". (Photograph: author's own, with kind permission from the British Museum).

Other small, clay geometric objects that were examined and eliminated from recording were objects catalogued as beads, spindle whorls, net sinkers and model wheels. All of these objects were found to be pierced completely though, with the large hole forming a significant proportion of the objects shape. As such, these objects are judged to have had a clear different function and are not recorded in the *Clay Object Database*. A collection of ten items catalogued as "impressed sealings" and three "sealings" from Tell Halaf all from Tell Arpachiyah were also studied and recorded in the *Clay Object*

Database. Each sealing is very different in terms of its form, impressions and presumably function, but as the number of "sealings" in the collection was small and many were fragmented making the original form unclear, all of the objects (rather than only those that might have operated as sealings in the way I define the term) were recorded. At least four of these objects appear to have functioned as actual sealings, being applied to an object to close it or protect its' contents and in addition, they have been stamped with a sealing onto the upper surface (see the following chapters for discussion).

5.6-DATA ANALYSIS

5.6(a) OVERVIEW

Once all stages of both object and contextual data was complete for all sites, at all tiers described above, evidence to explain the reasons for the initial appearance and the original, early function of the objects was sought by looking for evidence to verify or refute the most common interpretative scenarios proposed for the function of clay objects (Chapter 2). Due to the different recording strategies and limitations of many datasets, data analysis was undertaken in three principal groupings, incorporating – tier 1: case study sites (analysed in detail, site by site, then compared together), tier 2: Museum Collection and Publication objects (objects analysed site by site) and tier 3: *General Description in Literature* objects (general discussion comprising a broad survey of the presence of clay objects in the Neolithic Near East).

For each group of analysis, the aims were the same – to characterise the object assemblage and the type of context the objects were found in; in order to assess why the objects were created and how they might have functioned. In particular, analysis sought to test the theory that geometric clay objects acted as "tokens", functioning in the administrative sphere; either as simple counting tools or as more complex information storage devices. If clay objects were used in accounting, then we would expect to find them in an administrative context when recovered *in situ* within the case-study sites. Administrative contexts are fairly easy to recognise in the city-states of south Mesopotamia and the urban centres of upper Mesopotamia from the late 4th millennium BC onwards (see Chapter 2 section 2.3a-v). Yet in order to assess whether the Neolithic clay objects of this study might have been found in an administrative setting, thus supporting the interpretation of them functioning as administrative tools, a Neolithic administrative context must be defined.

In the Neolithic period, village life was much different to that of the later literate urban centres of Mesopotamia (Chapters 3 and 4), however an administrative context would not have necessarily have been too diverse from those of later times. A Neolithic administration context would not have been within a palace, temple or industrial production-as such features are absent from Neolithic settlements. No would we expect administration at this time to have been tightly regulated and controlled by a powerful, ruling elite. Yet just like their later counterparts, Neolithic villages communities would have had the need to count and record things, and may have wanted to keep a record of events, population counts or agricultural produce for example, for the short time and perhaps even long-term information storage. In this instance individuals or small groups based around family, kin or corporate ties may have utilised clay objects or similar items to count and record such things.

The location of a Neolithic administrative context could vary, with counting and other administration activities likely to have taken place in a wide variety of settings; anywhere on site in an external or internal space. Administration activities may have centred within, above (on the flat roofs of residential buildings of for example Çatalhöyük, chapter 4.2) or around (in open midden production and refuse areas between buildings, as present at Boncuklu Höyük for example, Chapter 4.1) domestic buildings, yet may also have been carried out within the large special purpose "Corporate" or "Communal" buildings common at many Neolithic sites (Chapter 3.5e). The important feature is the presence of caches of deliberately placed clay object. In a Neolithic administration context, we would expect to see a group of geometric clay objects, placed together, on the floor of a room or open activity space. They may have been placed in a ceramic or stone container, but more likely were placed in a basket, leather bag or pouch, or on a shelf or storage unit, thus what remains is a collection of objects in a group on the floor. This would be repeated a number of times within a single phase of a settlement if part of a small scale, site wide system, and likely across various phases of the same settlement, at the same location, and a number of locations within the site within and across phases. The items would be left in place once the transaction was completed, or moved to a more secure area to be stored, archived for future reference and verification of the administrative act. Following on from Schmandt-Besserat's symbolic theory, if caches of one or two shapes were found, this would represent a simple counting activity and archive, if caches of multiple shaped objects are found together in one group, then this represents the accounting of a number of different products in a more complex fashion.

If the archaeological indicators of the use of clay objects as administrative "tokens" are present, then a consideration of exactly what they were used to count, how exactly this would have been carried out and whether the objects had the same function at each site and at all times both within one site and across sites within the Neolithic were all ideas to be investigated. At all stages, systematic, exploratory statistical analysis was adopted. Metric and proportional analysis was undertaken, as was frequency distribution.

5.6(b) TIER 1 CASE-STUDY SITES

(i) Single Site Analysis

- Objects

Initially, detailed analysis comparing all aspects of object appearance including craft characteristics and subsequent unintentional characteristics, along with wear and the degree of fragmentation was performed at each case study site (see Chapters 6, 7 and 8). The aim was to characterise both the assemblage and also highlight the main variables of each case. The degree of standardisation within each site, the similarity and range of object types present are all important considerations when assessing the likelihood that these objects acted as "tokens"-aids in counting and administration. The same characteristics are even more important when considering if this symbolic system was universal throughout the Neolithic and across a number of sites in the Near East. Therefore, during initial analysis, clearly identifiable and distinct "sets" and "sub-types" of objects (according to any characteristic) within the assemblage, which may have had the capacity of conveying the same symbolic meaning, or at least performing a clear and predefined function were sought.

- Context

The immediate context of the objects was analysed in order to discern where on site the clay objects were used or discarded and if there was a particular absence of concentration of clay objects according to variables related to context. Within different context categories, the presence/absence and the number of objects was recorded-considering the presence, number and density of objects from different excavation area or trenches, phases of occupation and context types as recorded by the excavation team (such as "midden", "floor surface", "building", "pit fill", "ash layer" and so on). If the objects were used in recording and counting, they would be expected to be found in areas of the site where such activities were undertaken, stored together, thus

recovered in *in situ* caches, representing a group of clay objects transported and stored together in a bag, basket or leather pouch (since decayed), stored for future reference as a record of a count or transaction. Similarly, if stored goods were present in all phases of a site's occupation, then the objects would be expected to be present in all occupation phases and if not, then an absence or reduced density of objects would be anticipated. Any particular concentration of objects in a particular context type was noted in order to investigate its possible significance further.

Aside from the mere number and concentration of objects within different contexts, the nature of the objects within and across context types was also investigated, to see if objects of a particular type tended to be found only or more often in certain contexts, or if the type of objects diversified through time, was more diverse in certain areas of the site, or if objects with a particular quality were only found in certain contexts. Again if objects of a particular shape, or displaying specific markings represented a set commodity as Schmandt-Besserat has presented for the Uruk period onwards, then perhaps objects of a certain appearance would be found clustered together, or at least the same two or three main forms be found in the same types of contexts. If as Schmandt-Besserat suggests (see full discussion in Chapter 2, sections 2.3a and 2.4a) objects of a specific shape represented a specific commodity, with only cones used to count and account barley and spheres for beef for example, then caches of only spheres would represent an accounting activity involving only one good: beef, whilst if two or more shapes were present within a single clay object cache, this would indicate a transaction involving multiple different types of goods-a more complex administration activity. This theory will be tested by considering not only the appearance of clay objects, but they contextual association, and a comparison of this within certain buildings, areas and phases of sites, as well as across sites. Lastly, what the clay objects were found with-if any was investigated in order to further consider their function.

As a way of assessing the main scenarios of functional use of Neolithic clay objects, counting and accounting tools, gaming pieces and toys the types of evidence likely to suggest such uses were considered, and then the evidence from each of the case-study sites, along with additional evidence from the tier 2 and 3 sites, in order to weigh up the likelihood of the clay objects operating in the fields most commonly proposed. For example for administrative accounting tools, we would expect to find caches of clay objects grouped together on the floor of a room (where they had once been held

together in an organic container), stored as the record of a count, archived for future reference.

(ii) Cross-Site Analysis

As objects from each case study site were recorded in the same level of detail, data from the analysis of each assemblage could easily be compared in order to assess the degree of similarity or difference across the different sites in terms of the objects present, degree of uniformity of the clay object assemblages found at each site and the type of context the objects came from at one site compared to another. The main patterning evidenced in each stage of analysis described in 1a above was therefore undertaken comparing each of the case study sites to see if any clear differences could be seen across the sites (see Appendix H). The degree of similarity or difference across sites was then used to assess if clay objects had a similar or identical function at different sites, or whether they appear to have been used in distinct, unrelated ways across the Neolithic Near East. This is of course important as in later periods it is clear that they functioned a part of an inter-site recording system. Differences or similarities in terms of the type of objects, the presence of, range and proportions of different shapes, degree of diversity of object assemblages and types of context they are found at was compared to site specific characteristics in order to discern whether sites with different characteristics (being form different regions, time periods, of differing degrees of social complexity for example, had similar sets of clay objects or not and whether they appeared to have been used in the same way despite differences in site features, or whether differences in site features was reflected in object assemblages of a different nature, degree finish or uniformity or function for example.

5.6(c) TIER 2: MUSEUM COLLECTION & PUBLISHED OBJECTS

A similar approach was employed with objects recorded from publications and museums; however the same degree of analysis was only possible for the 'Ain Ghazal collection (Chapter 9.3). The tier 2 objects were looked at in as comparable a fashion to the tier 1 sites as possible, on a site-by-site basis. For objects where additional tier 3 object data or context descriptions were held, these elements were incorporated into the general discussion.

5.6(d) TIER 3: GENERAL DESCRIPTION IN LITERATURE

The most variable records come from the tier 3 data, of which some sites also have objects recorded at tier 1 or tier 2 level (see Appendix J). Representing data from a

large number of sites, covering the entire broad Neolithic period and all regions within the Near East; the main aim was to chart the presence or absence of clay objects, across the region during the Neolithic period. Where clay objects were known to have been found, the total excavated number (or approximate count) was recorded, along with the level or date of their occupation if possible. If no record of the presence of clay objects could be found in any literature related to the site, this was noted. Only sites where clay objects were definitively stated as absent, or present in very low numbers only (such as only 3 or 4 examples) was the site deemed to be one at which clay objects not extensively utilised.

In addition to the presence or absence of clay objects, many varied details related to the nature of the individual sites were recorded including – location, period of occupation, environment, size of site, estimated population, density of settlement, number of structures, type of structures (i.e. purely domestic, or sites with "corporate" or "ritual" building), exchange goods in circulation, on-site craft activities, subsistence strategies and burial practices. The date of excavation, excavation techniques (such as whether or not sieving and flotation was employed and to what extent), how inclusive the publications are (i.e. whether site reports detail all finds or mainly the ornate and well finished objects) were all assessed. Also, objects are not recorded as being absent from a site due to a lack of reference to them in publication, only if they are specifically stated as being absent, and there is evidence that they were looked for during excavations (either in site reports or by the excavators in personal correspondence).

This data was then assessed to compare the distribution of sites with and without clay objects across the Near Eastern regions, through time and to see if they were more likely to be found at sites with specific characteristics, features, activities or subsistence strategies or not and the sites with a degree of detail on the presence of objects and the general form allowed more in-depth discussion of those sites to be attempted. This final stage of data analysis, though not directly related to the detail of the objects themselves and the bulk of data collection, provided a useful, broader overview of the distribution of clay objects and importantly in relation to many important features, characteristic of the Neolithic period. Clay objects initially appear in the Neolithic period, alongside many new and intriguing features and developments (including animal management strategies, plant domestication, new forms of symbolic expression, permanent sedentary villages; Chapter 3) and this approach was employed in an attempt to link the presence of the objects to these new behaviours and lifestyles.

5.7-SUMMARY

The recording strategy and methodology outlined above has allowed me to analyse and present my findings in a unique, coherent, up-to date format, allowing data from many different sites and object collections to be studied and compared side by side, as the data from all sources is presented in the same format. To date, these objects have only ever been considered in an isolated context, on a site by site basis, within individual site reports. As discussed in Chapter 2, generally only a small number of objects are recorded in site reports, with little detail regarding dimensions, form, use-wear markings and fabric for example. Furthermore, no comparison is made between the objects or analysis in terms of their distinguishing features and the degree of similarity or difference between objects from the site. Also, very rarely is the context from which the objects hail from recorded, published or taken when assessing the function of geometric objects. In general, data from sites is presented in isolation, or by comparison of a small and specific selection of objects from a handful of sites only, generally comparing one or two remarkable objects from a particular site, to one or two more from another site, or a comparison of different object categories such as stamp seals, figurines and geometric clay objects (for example Kuijt & Chesson 2005, Mahasneh & Gebel 1998).

CHAPTER 6: BONCUKLU HÖYÜK ANALYSIS

6.1-INTRODUCTION

Small geometric-shaped clay objects are one of the most abundant artefact categories excavated at Boncuklu Höyük to date, constituting more than half of all recorded small finds at the site. Boncuklu's clay objects are not easily confused with other artefact categories as there are few other clay find types at the site. The comparatively scant clay figurine fragments, clay vessel fragments and clay beads (Baysal Forthcoming) are very distinct. At the end of the 2012 excavation season, a total of n=672 geometric clay objects had been registered, almost all recorded in full (n=559). Considering the multitude of characteristics noted, the objects are fairly homogeneous in nature but there are no clearly defined "sets" of identical objects. Below, a selection of the main characteristics of Boncuklu's clay objects is presented, in order to highlight the overall nature of the assemblage. Additional illustrations can be found in Appendix B.

6.2-THE OBJECTS

6.2(a) BASIC FEATURES

The average weight of Boncuklu's clay object assemblage is 3.38g: ranging from very light fragments of objects (from 0.05g) and complete objects of 0.30g up to 70.70g. 74.06% of objects, however, weigh less than 4g. Object size as recorded from three angles reveals the average size in all three-dimensions is approximately 1.00-2.00 cm. The largest object was 10.00 cm long, though the overwhelming majority, at least 98% of objects, measured less than 5 cm in all three-dimensions. Considering the degree of fragmentation (important when assessing comparative weight and size) almost half of Boncuklu's clay objects, 49.37% were completely intact. Of the incomplete objects, many (20.39%) exhibit only a small chip or amount of breakage and only 30.23% of the assemblage consists of objects where less than 75% of the original shape is present.

6.2(b) THREE-DIMENSIONAL SHAPE

The assemblage covers a total of seven basic three-dimensional shapes (figure 6.1), further subdivided into 14 sub-types (figure 6.2 and table 6.1). Assessing the seven basic shapes, spheres constitute over one third (32.74%) of all objects. Discs and ovoids are present in near equal amounts, 23.08% and 20.39% of the assemblage, respectively. Including sub-types, a far larger range of shapes are present, with flattened/semi-spheres dominating at 106 objects. Four other shapes: full spheres (n=77), flattened/semi-ovoids (n=66), disc type 2 (n=66) and disc type 1(n=60) are all found in fairly equally high numbers, comprising over 75% of the total assemblage between them. In contrast, cones and cubes/cuboids are rare. Clay objects as classified by three-

dimensional shape do not share any further similarities amongst each other to further unite them or make them distinct from objects from any other shape category neither in terms of size, colour or craft.

6.2(c) CRAFT & MANUFACTURE

Boncuklu's clay objects are all fairly similar; although simple in form, most of the objects are crafted from fine clay, with few inclusions and a smooth outer surface finish. Almost all, 96.41% are crafted from a fine textured clay (just 3.41% are coarse). Over three quarters have a "smooth" outer surface finish. The craft technique is simple and clear in many cases; half of the objects are rolled and then moulded/sculpted. 6.64% display fingerprints, 53% of which have only one or two prints per object. 19.21% of objects have clear finger-tip sized depressions on the outer surface and just 2.51% have pinched areas of clay on the surface.

Inclusions (as seen through a hand lens) are mainly mineral where evidenced, though more than half of the clay objects (60.68%) have no visible inclusions and 9.34% display visible organic inclusions. Accordingly, the objects of "fine" clay texture have fewer inclusions overall; just 6.89% of "fine" textured objects display organic inclusions and 61.45% of them display no inclusions at all. In contrast, of the objects recorded as "coarse" in clay texture, 42.11% have mineral and 10.53% have organic inclusions. A further 5.26% display both types. Likewise, the proportion of objects displaying inclusions decreases with the increase in smoothness of the exterior surface. Mineral inclusions are dominated by limestone/calcite, present in n=166, almost one third of all Boncuklu objects. Mica and chert-radiolarite are the next most numerous, though far less common, found on only 1.80% and 1.62% of all Boncuklu objects respectively. Organic inclusions, though present in much smaller proportions than mineral, are more diverse in range, including plant/reed (n=26), shell (n=10), bone (n=7) and charcoal (n=2). All of the above features are clearly unintentional aspects of clay selection and object production, yet distinguish the objects from each other to a degree.

6.2(d) HARDENING

Almost all, 89.41% of Boncuklu's objects are hard and solid, many came through flotation and others could be cleaned with a damp cloth or brush without fragmenting. A smaller number were much more crumbly and fragile. Therefore, it appears that most underwent some kind of intentional hardening process, recorded as "baked" or "unbaked" (in terms of terminology although the exact process is not definite). A small

number of objects are burnt in appearance (6.46% "definitely" and 7.36% "likely", 13.82% combined), with the clay blackened on one, both or all sides. Whether the burning process was deliberate is unclear, but if so, the intention appears to be purely decorative as it certainly does not appear to be the case that burning was a side effect of baking or hardening. There is no correlation between the hardened and burnt objects; 76.12% of objects are "baked" and *not* burnt; whilst only 13.11% are *both* baked and burnt.

6.2(e) COLOUR

The objects are present in various shades of brown, orange and grey, with objects at either end of the colour spectrum rare. Grey objects dominate overall with "mid-grey" the most common colour selection. 28.55% of Boncuklu's objects are described as solely or include "mid-grey" in their colour description (n=159). "Dark grey" is the next common at 19.95% (n=111). Brown objects are also numerous: "v. light brown/beige" at 11.3% (n=63), as well as "mid-brown" at 11.76% (n=65). Between 8 and 9% of clay objects are characterised as displaying various other shades of grey and brown ("mid-light grey" (8.44%/n=47), "orange-brown" (9.34%/n=52) and "light grey" (8.08%/n=45). The range of colours represented, rather than suggesting the deliberate selection, appears to indicate the use of a restricted range of clay sources; with subtle, unintentional differences in the precise shade of clay due to the fact the objects are almost all essentially unfired clay.

6.2(f) IMPRESSIONS & SEALINGS

The presence of impressions (as the likely unintentional result of the crafting process) was recorded to discern if there is any patterning in their presence, related to the surface the objects were crafted, dried or baked on. Furthermore, the various characteristics of objects with impressions were compared, to see if, for example, certain shaped objects display particular impressions or higher proportions of them. The type of impressions were recorded, where clear, along with the possibility of the presence of the impression(s) being related to the use of the object as a sealing in order to assess: a) if and how many sealings were present and b) what kind of storage containers may have been sealed. A substantial number of objects, (n=114/20.47%) have evidence of impressions (table 6.2 and figure 6.3). The majority of these are unidentifiable (n=46 /73.02% of objects with impressions) and for many others, only tentative attempts at identification could be made. The types of impressions vary, dominated by reed or plant impressions. Basketry, matting and rope/string impressions are also evidenced.

The shape of impressed objects was also considered, alongside the size and degree of fragmentation (it is assumed that sealings may have been larger than standard geometric clay objects in order to have fulfilled their role). Sealings by definition are more likely to be fragmented where they have been broken in order to access the stored item(s). Unlike the other recorded objects, sealings are not necessarily geometric, but display a rough surface where they were pushed onto the item to be sealed and a concave underside reflecting the shape of the sealed item, along with possible impressions of it. Of the 114 objects with impressions, n=53 were the result of the object being applied to a flat surface. n=33 were the result of the clay being applied to a two or three-dimensional object. However, of these, only n=43 objects were considered as possible sealings within only n=5 identified as a sealing with a high degree of certainty (table 6.3). The identification of sealings establishes that the residents of Boncuklu Höyük were sealing things on site. Though only evidenced on a small scale, the fact this process is evidenced within this modest community is significant. In addition to the 5 definite sealings, it is likely a number of the 38 other objects also operated as sealings, being used to secure the lid or join of a container or package in order to close and perhaps to control and monitor access.

6.2(g) DECORATIVE MARKINGS

15% (n=85) of clay objects at Boncuklu Höyük display intentional, symbolic or decorative "markings", representing either applied or impressed decoration in equal proportions (40.70% of each). Only two had possible fingernail decoration, also evidence (in small proportions) on objects from other southwest Asian sites (e.g. Çatalhöyük and Tell Sabi Abyad). A large range of decorative designs are found including straight lines, sets of parallel lines, incised circles, round holes/depressions and crossing lines (figure 6.4). The majority of "marked" objects are not entirely covered in decoration; most (41.9% of marked objects) have between 25% and 49% coverage. Markings are most commonly found on either only the base (29.07% of marked objects) or top (34.88%), with fewer objects recording markings on both the base and the top (17.44%). In terms of clarity, 73.26% of marked objects have an immediately recognisable ("very clear") marking.

Fairly even numbers of marked objects present either a single marking (n=36), or groups/clusters of markings (n=48) (see table 6.3 for descriptions and proportion of each "type" of marking). Objects with groups of markings tend to have many overlapping

markings, either in the form of straight parallel lines or intentional plant/reed impressions. Evaluating the overall range of markings; straight, independent lines dominate – present on 51.16% of marked objects (either alone, or in combination with other markings). Plant impressions and sets of straight parallel lines are also common, seen on 29.07% and 25.58% of marked objects, respectively (figure 6.5). Objects with a single straight line are the most common, 29.07% (n=25). Objects with straight parallel lines are the next most abundant at 16.28% of marked objects (n=14). 14% of the objects combine straight, parallel lines with plant impressions (n=12). All other combinations of markings are present in very small numbers, the same design found generally only on one or two objects (table 6.3). Though most of the markings appear intentional, is does not seem that markings created distinct categories of objects compared to their unmarked counterparts. The marked objects are not standardised in terms of the type of marking (form and clarity), shape and size, or the degree of object coverage. In summary, markings on objects where present are clear and deliberately created. Yet, rather than representing part of a systematic symbolic system, are created spontaneously as part of a fluid and unplanned system, rather than being added to distinguish sets of objects.

6.2(h) RELATIONSHIP BETWEEN DIFFERENT ATTRIBUTES: OBJECT STANDARDIZATION

(i) Shape & size

The variability of objects within and across each three-dimensional shape, considering all other characteristics was investigated (e.g. weight, size, colour, proportions of burnt, marking presence, marking type, hardening and impressions) allowing analysis of the degree of uniformity within each shape grouping. This should clarify how similar objects grouped together under one three-dimensional shape category were to one another, and dissimilar to objects of all other shapes. Considering the degree of shape standardization within each three-dimensional shape category, a varied degree of shape size and consistency of proportions is seen. Within each shape category, the objects cover a wide and random range of sizes from <1.00 cm to 5.00 cm, with no particular grouping of size within this (figure 6.6). Size standardization within each three-dimensional shape category is therefore not apparent, with a variety of sizes represented across all shapes. Overall, consistency of shape is also lacking, meaning that although most Boncuklu objects can be fitted into one of the pre-defined three-dimensional shape categories, there is a lack of correlation between size ratios, the degree of definition of corners and the straightness of sides. This means that Boncuklu's objects can remain varied in appearance, even within a single shape grouping. There are exceptions to this rule

however, and select Boncuklu shape assemblages are homogenous with regards to shape proportions.

Spheres for example are regular in terms of all being well rounded (measured by an evenness in diameter when measured from a variety of angles). Spheres at Boncuklu display a conventional appearance therefore. Like all other shapes, sphere size is not restricted to one or two sets of sizes, but a random range of sphere sizes are exhibited. Despite this, the uniformity of sphere shape (in the degree of roundness) means that they are consistently homogenous in shape, and clearly distinct from the flattened and semi-spheres which have a distinctly reduced height/thickness in comparison to their length and width, meaning these objects were intentionally semi-spherical or flattened, rather than representing misshapen or sunken spheres. The same is true of the ovoids and flattened/semi-ovoids (figure 6.7). Cones also demonstrate a high degree of shape standardization as measured by the ratio of cone height to base diameter (width). This can be seen within all three cone sub-types. Again, despite having a consistent and uniform appearance in terms of shape, a varied and non-standardized range of sizes are found within the cones (figure 6.8).

(ii) Shape & other characteristics

Size aside, the clay objects from Boncuklu have many shared features cross-cutting three-dimensional shape categories. For example there is no correlation between the degree of burning or baking and three-dimensional shape. Very slight differences in proportions can be seen in the presence and type of marking by three-dimensional shape. Likewise, considering the most common type of markings (single independent lines and sets of parallel lines), alongside the most common three-dimensional shapes (spheres, semi-spheres, ovoids, semi-ovoids, disc type 1 and type 2) all selected shapes contain fairly even proportions of the most common marking types. The parallel line motif may display some patterning, as they are found on 7.58% of the flattened/semi-ovoids, but only 4.92% of the "misc. /other" classified objects, 1.89% of semi-/semi-spheres, just 0.20% of ovoids, and none on spheres (figure 6.9). More stark differentiation can be seen in the presence of possible or definite impressions and three-dimensional shape. Impressions are found on 11.27% (n=63) of objects overall. When considering the 8 most common three-dimensional shapes (including "miscellaneous."), flattened/semi-spheres and flattened/semi-ovoids have a similar proportion of impressed objects to the overall assemblage. Ovoids and spheres, in contrast, display few impressions. Impressed objects are absent from the disc type 2 assemblage, yet in stark

contrast 20% of disc type 1 and 31.15% of "misc./other" shaped objects display impressions.

In terms of object fragmentation some differences can be seen, discs for example (all sub-types) were the least likely to be complete. None of the type 3 discs were recovered intact, and disc types 1 and 2 only contained very small proportions of complete objects (30% or less of each sub-shapes' assemblage). In contrast, rounded objects (spheres, semi-spheres, and semi-ovoids) have high frequencies of complete objects, constituting at least 55% of each of these categories. These differences however, are likely due to the shape of the objects than reflecting differential use and disposal practices. Discs being thin and easily snapped are far more likely to be unintentionally damaged during use or post deposition. No evidence of the intentional fragmentation of Boncuklu's clay objects the objects is evident. All damage or lack of damage appears to be due to an object's shape and the process of deposition.

Of the marked objects displaying the most common combinations of markings, there is little correlation with other characteristics, suggesting the marked objects, even those with the most common designs, did not form a clear and distinct object category. One exception is found however, in the form of three objects with similar markings in conjunction with other characteristics. CO#s 871, 1465 and 1508 (SF#s 1186, 1413, 1330, figure 6.6) all display two markings in the form of deep, parallel lines, applied to a convex top surface. Within the marked objects, standardised categories or sets of objects would be expected if they were used to store or convey information in a systematic way, on a long term basis. However, while markings are definitely intentional in the majority of cases, it appears that they were applied on an ad hoc basis, either for a purely decorative purpose or perhaps to convey meaning for a single and immediate function before being disposed of.

6.2(i) SUMMARY

In general, Boncuklu's clay objects are remarkably similar across a broad range of characteristics. Although within each attribute studied a range of characteristics are represented (i.e. clay shade/colour, presence and type of inclusions, outer surface finish), the vast majority of objects share many common features being small, lightweight, crafted of fine textured clay with little or no inclusions. Almost all are intentionally hardened and the majority have no evidence of burning, impressions or intentional decorative markings. The wide range of clay colours present and it's lack of

correlation to other features (including clay texture, outer surface finish and three-dimensional shape) does not suggest a specific clay type was selected for the manufacture of the objects or a certain category of object within the assemblage. All clays used appear to be consistent with the range of locally abundant clay types of the Konya Plain (as recorded by Doherty 2013: tbl. 1). Likewise a study by Avis (Avis 2010: 102-03) on a selection of figurines from the neighbouring site of Çatalhöyük reported no correlation between clay type and object.

The attribute which most clearly distinguishes Boncuklu's clay objects is three-dimensional shape. A huge 75% fit within three basic shapes (spheres, ovoids and discs), and into six if one also considers the variants (sub-types) of these. Uniformity of shape is enhanced by the standization of the ratio between, length, width and height of some shapes (the rounded shapes and cones specifically). Yet even these shapes are not present in a set and restricted range of sizes (aside from the obvious parameters of the study: <5.00 cm). Within each shape category the objects do not form distinct, clearly recognisable groups and have little in common with each other aside from their well-defined shape. There are no features specific or unique to a particular three-dimensional shape and objects, regardless of shape, display many shared features with regards to size, other aspects of appearance and manufacture characteristics. This contrasts to the equally large assemblage of small geometric clay objects studied from the neighbouring and immediately later site of Çatalhöyük where there are small yet very clearly distinct sets of objects with a high degree of standardization of shape, size and other attributes (see Chapter 7 and Bennison-Chapman 2013).

6.3-OBJECT CONTEXT

6.3(a) OVERVIEW

Geometric clay objects have been recovered from all excavation areas and from most Neolithic phases at Boncuklu Höyük. Not all of the objects come from a clear, stratified context with a volume record (to enable density analysis); therefore, within each stage of analysis, the total number of objects assessed varies.

6.3(b) SITE AREA

Boncuklu's clay objects are distributed over seven excavation or surface scrape areas covering a total of 546 objects (97.67% of recorded objects). Almost half come from Area H (44.87%, n=245, 0.08 objects per litre) and over one third from Area M (31.87%, n=174, 0.04 objects per litre). Areas K and N have significantly less objects (n=49, 0.03

objects per litre and n=40, 0.01 objects per litre respectively) (figure 6.10 and table 6.5). The remaining 38 objects come from Areas O, Y and Q (see figure 4.1-3 in Chapter 4 for site plan). Looking at the four areas where clay objects are most dense; trenches, K, H, N and M, the clear differential distribution in the number of objects per area is reflected in density analysis. Excavation in Area N has focussed on two buildings (Buildings 6 and 10), especially their post occupation fills. Thus objects were deposited in low frequency in Buildings 6 and 10 and intriguingly also in the structural debris and midden admixture filling these buildings (Baird *et al.* Forthcoming). Area K, where again mainly buildings have been excavated, has the next lowest density of clay objects. Areas H and M, both of which are substantial midden deposits, have the highest clay objects densities (table 6.5).

There is little evidence that clay objects with specific attributes were differentially distributed across the site. For instance, there is little difference in the proportions of objects of different three-dimensional shapes found in each trench, though some differences are apparent (figure 6.11). Differential distribution of shape is seen in Areas O and K, which both have significantly higher proportions of ovoids than discs, in contrast to Areas M and H which evidence fairly even proportions of ovoids and discs. Likewise Area Q has far more discs than ovoids. In addition, cylinders constitute a large proportion of Area N's objects (22.50 % compared to the site average of 6.96% and Area K average of 10.20%). Homogeneity is seen in the distribution of spheres. Nearly half of all spheres (n=80) derive from Area H and the majority of the rest (n=60) are from Area M. Of the definitive sealings (n=5), three come from Area M, one is from H and one from K, broadly reflecting the density of objects in each of these areas.

Considering the larger collection of 43 "possible" sealings, they remain fairly evenly distributed across the main site areas (Area H n=21, Area M n=10, Area K n=7). This suggests that if these were indeed used to seal stored goods, this activity was carried out in all areas of the site, in both buildings and midden zones. Likewise, objects displaying markings, show little differentiation in their distribution (figure 6.12). Areas M and H however do exhibit objects with a greater diversity of markings and marking combinations than Areas N and K, both of which show little diversity. In Area N, only 4 different kinds of markings are present. Likewise, no marked object within Area N contains more than one marking style. Though the lack of diversity in some areas may be due to the small number of marked objects in those areas.

6.3(c) CONTEXT TYPE

A total of n=426 (74.60%) of clay objects at Boncuklu come from a clearly defined context. Nearly half (47.58%) were recovered from middens, the remaining objects hail from a diverse range of other context types. This all equates to 24 different types of context, with relatively small numbers of objects in each (table 6.4). After "midden", the most numerous context type is "structural debris", containing n=43 objects (7.69%). The large proportion (47.58%) of clay objects recovered from midden and structural debris contexts types complicates the interpretation of object use. Middens clearly include some refuse from other locations (hearth rake out and floor sweeping from buildings for example) and re-deposited material along with some primary discard from *in-situ* activity (Baird *et al.* Forthcoming). Structural debris includes much re-deposited material. Thus, for objects hailing from these two context types, it is impossible to ascertain where the objects were initially used. In addition to middens and structural debris, geometric clay objects are found (in very small numbers) in some distinctive context types, which may offer interesting insights into their use. These include: "ash/charcoal" (n=5 /0.89%), "burial" (n=14 /2.50%), "pit-fill" (n=16), "posthole-fill" (n=3) and "hearth-fill" (n=4). In addition, 6 objects were located inside floor surfaces and a further 2 from floor contact deposits. Those in the floor surface contexts were probably trapped between floors upon re-plastering (Baird *et al.* Forthcoming) having been left over from floor sweeping.

The large number of objects retrieved from middens likely reflects the equally large volume of midden material excavated rather than the true density of clay objects within them. Despite their numbers, clay objects are relatively sparse in middens with only 0.5 objects per litre of deposit (figure 6.13). In contrast, three context types, "burial-fill" (0.97/l), "pit-fill" (1.00/l) and "floor surface" (0.92/l) all have a significantly higher density of clay objects in comparison. These three distinct context types are clear evidence of the utilisation of geometric clay objects within the private space of the home (though burial fill likely contain objects re-deposited from elsewhere). All of the excavated buildings at Boncuklu Höyük (Buildings 1 to 7, Buildings 9 and 10) contain at least one clay object, yet overall, objects from buildings constitute less than one fifth of all clay objects from Boncuklu Höyük (19.49% come from buildings, 58.93% do not come from buildings, 21.58% have no record at present). Two objects from "pit-fill" contexts come from clearly stratified deposits within Burial 4 (Area H) and one of the "post-fill" objects was found clearly within B3 (Area K). Also within B3 was a geometric clay object from a "floor surface" context type and a clear "floor contact" object came from Burial 5

(Area H). Clay objects found within buildings tend to follow the overall trend in terms of the presence and proportion of three-dimensional shapes present within them. Within the entire Boncuklu assemblage, spheres, ovoids and discs (broad shape categories) are the most common shapes, and comprising 76.21% of all objects recovered (all other shapes combined forming the final quarter of objects). Of the objects from buildings with ten or more objects (Buildings 1, 4, 5, 6 and 9), this same proportional tend is reflected, thus demonstrating the typical building-based assemblage (figure 6.14).

Analysis was also carried out on the distribution of objects with specific attributes across various other context types (see Appendix B). Three-dimensional shapes seem more or less proportionately distributed across these various context types. For example, the proportion of burnt objects from context types was proportionate to their overall occurrence in the assemblage, c. 14%. There are no burnt objects from burial, floor surface and floor contact contexts. Context types with slightly more than the site average proportions of burnt/possibly burnt objects include pit-fill, post-fill and ash/charcoal, though all context types retain very low proportions of burnt objects (figure 6.15). This is not surprising, since these three contexts probably include hearth rake out material, where clay objects would be accidentally burnt. However, it is surprising that the hearth contexts do not stand out in this manner.

The location of definite and possible sealings across different context types reveals just how rare they are at the site. Many context types from structures have none at all (ash, floor surface, posthole, hearth-fill, pit-fill and floor contact), so perhaps sealed materials were not often opened inside or kept within buildings. Context types with no marked objects are floor contact, pit-fill and hearth-fill. Context types with slightly higher than site average proportions of marked objects include: ash/charcoal – 33.33%, burial-35.71%, post-hole – 33.33% and floor surface-25.00%. Although each of these contexts has only a small number of objects this is an interesting pattern, perhaps indicating specific deposition and/or use in certain areas. The three very similar marked objects (mentioned above, figure 6.6) all come from different site areas (figure 4.1-3). CO# 1508 is from a midden context in Area M (context MDM), while CO1465 was from a surface in the hearth area of Burial 4 (HNG), and CO# 1508 is from a burial, Grave 19 in Area Q (ZQE). This last object was likely not intentionally placed in Grave 19 as it was not closely associated with the body. Burials containing clay objects are distributed over a range of areas of the site, mostly from within buildings, but while most of the burial contexts appear to contain geometric clay objects, this is re-deposited material and does not

appear to be closely associated with the burials. Furthermore, the fill used to top the burial likely came from outside of the home, rather than representing internal floor sweepings and refuse, therefore, it can be concluded that clay objects from in house burials represent the unintentional deposition of objects from exterior sources.

Overall, the evidence from context type analysis hints at some interesting patterns. There does not appear to be any clear differentiation between the number and type of clay objects found across different context types, though the density of clay objects within distinctive deposits is notable. Geometric clay objects were certainly utilised by individuals or small groups of people inside the small, private, domestic space. Additionally, their presence in huge numbers within midden contexts, further supports this notion. Middens represent large volumes of excavated material at Boncuklu, a small yet significant proportion of which relates to household refuge in the form of floor sweepings and hearth rake-out, as well as structural debris. It should however be noted, that Boncuklu middens were activity spaces in their own right (see Chapter 4.1); utilised for communal activities as evidenced by the presence of craft production debris, hearths for communal cooking and food preparation and plastered surfaces. As such, in addition to individual use within the private domestic space, the complexity of the middens also clearly points to the use of clay objects in large, open, communal areas by groups of people. In summary, the bulk of clay objects deposition within midden spaces relates to external activity. This suggests clay objects were primarily used outside, in communal spaces, as well as occasionally inside the domestic space.

6.3(d) SPATIAL MAPPING

Though the majority of objects were found in middens and many came through flotation, a significant number had three-dimensional co-ordinates, allowing them to be mapped precisely in relation to features using GIS software. This has been undertaken with 120 small geometric objects to date. Certain areas show the clustering of clay objects, other area hint at the grouping of clay objects of particular characteristics. For instance, within Area H, the midden accumulating within the shell of Building 5 can be seen to have a particular concentration of clay objects within just one part of the midden (figure 6.16). Given the nature of this midden accumulation, the cluster of clay objects is likely to relate to disposal, highlighting that groups of clay objects were dumped in this specific area of the midden within Building 5 after use. From this, it can be inferred that clay objects were used together in significant numbers. Within Building 4, clay objects cluster in and around its hearth (figure 6.16). This very likely indicates a more general pattern of the

use of clay objects in the areas immediately around the hearth, within buildings, supporting the previous example which suggested some in-building use.

The clustering of specific shapes or clear absences of certain shapes is demonstrated in a few instances. Flattened ovoids and flattened spheres appear to show distinct accumulations clustering in specific trenches and areas of trenches such as in the midden space of Area H (figure 6.16). Clay objects with unintentional impressions are sparse within the entire assemblage; yet intriguingly they cluster in one phase of Area H (figure 6.17) and rather than being randomly distributed, appear to be grouped together. This spatial patterning contrasts to the few items with impressions in Areas N and K which are more randomly distributed. Similar patterning can be seen in the case of objects with markings, within Area M and H where there are marked objects (small in number compared to the unmarked objects), they cluster together in one area of the trench (figure 6.18).

(i) Spatial Analysis Summary

Geometric clay objects are widespread at Boncuklu Höyük. They were used and disposed of in all excavation and surfaced scrape areas. Almost 75% of all Boncuklu objects come from two trenches-Areas H and M. However, there is no distinction between the types of objects found within each area of the site. The immediate context of clay objects is diverse, however, many of the specific designations point to the use of clay objects by individuals or small groups of people within the private, domestic sphere. This is supported by the preliminary spatial mapping where the clear presence of objects *in situ* within buildings is attested, often in association with particular features as alluded to in the context type analysis (hearths and pits). Almost half of all objects come from middens, representing external activity and house refuge (and thus, again, small scale use inside buildings), but also potentially the use of the objects in large, external, communal work, food preparation and cooking areas within middens.

6.3(e) CHRONOLOGICAL ANALYSIS

(i) Phase Within Trench Sequence

Within each of the four main excavation areas (H, K, M and N, n= 474 or 85% of recorded objects), stratigraphic relationships are clear. For each, the number of clay objects per phase was assessed, in order to discern if clay object presence increased or decreased over the course of occupation within a given area. Analysis shows that for each site area, there is a differential distribution of clay objects temporally. For example, six Neolithic

phases are represented within Area K, yet almost one third (32.65%) of Area K's clay objects come from a single phase, phase K.II (figure 6.19). In Area H, two thirds (66.53%) of the area's clay objects came from a single midden deposition phase, phase H.III (figure 6.19). Within Areas M and H, again more than 60% of each area's objects come from a single phase; phase N.IV (Area N) which is dominated by Burial 6 fill (62.50% of N's clay objects) and Area M phase M.III (68.97%) (Figure 6.19). This could suggest differential use or deposition of the objects through time. Therefore, to assess temporal variation it seemed more meaningful to use the broad site chronology (Baird *et al.* Forthcoming) and analyse the objects by broad site wide phases as applied across the four main areas.

(ii) Broad "Earlier" & "Later" Neolithic Phase Analysis

As Baird explains (Forthcoming) a broad correlation can be made between the sets of phases identified across different site areas. For the purposes of this analysis it seemed most robust to group these into two broad sets representing "earlier" and "later" occupation phases (see figure 6.20). Based on C14 dates, Boncuklu's "earlier" set of phases (Areas H and K: phases H.II–H.VI and K.II-K.VII) can be placed at approximately 8,400-7,900 cal. BC, while the "later" phases (Areas M and N: phases M.II-M.III and N.II-N.IV) post-date this and run down to approximately 7,500 cal. BC. A total of 324 objects can be assigned to these two groups of phases (figure 6.20).

The number of clay objects found within each phase is fairly even (n=250 "earlier", n=191 "later"), with a slight decrease into the later phases of occupation (figure 6.21 and table 6.5). Correspondingly, the density of objects decreases, through time. There is less than half the density of clay objects in the later phases. Despite a decrease in the number and density of objects through time, no clear change in the nature of clay objects over time is evident (see for example figure 6.22). The same broad three-dimensional shapes are present in both the earlier and later phases, and in similar proportions. Overall, 76.21% of objects are represented by just three shapes; spheres, ovoids and discs. These same three shapes are the most common in both the earlier and later Neolithic phases; constituting 76.97% of all objects from earlier Neolithic phases, and 77.54% of all objects in later Neolithic phases, yet the proportion of objects within these three shape categories does differ slightly between the two phases (see figure 6.23).

Considering the presence of marked clay objects, the same proportion of objects are marked in both Boncuklu's earlier and later phases of occupation (n=34, 13% of earlier phases objects are marked. n=25, 13% of later phases objects are marked), and there is

little difference in any aspects of appearance of the assemblages of marked objects from the earlier compared to the later sets, not compared to the assemblage as a whole. Likewise the diversity in marking form is consistent across both phases. The location of markings is consistent across both phases, yet the degree of coverage of the markings on objects changes through time, with marked objects from the later phases evidencing a larger proportion of object covered. Only 18% of the marked objects have full coverage in the earlier phases, while in the later phases, the proportion with full coverage increases to 32%. In the later Neolithic assemblage, no markings are recorded as "faint" or "hardly visible". Almost 90% are "very clear" compared to just over 60% of the earlier phase objects. Where combinations of designs are seen, plant impressions and straight parallel lines dominate in both phases and are present in fairly even proportions, yet in terms of other combinations present, the later Neolithic is slightly more diverse.

All of the evidence related to specific phases or to the broader perspective offered by comparing earlier and later groups of phases suggests the nature, use and deposition of Boncuklu's clay objects remains largely consistent through time. Therefore, if they were used in counting or administration, the practices giving rise to such administrative activity probably changed little over much of the life time of the settlement. With no caches of *in situ* geometrics discovered, a clear administrative context (see Neolithic administration context discussion, Chapter 5.6a), to support Schmandt-Besserat's agricultural administration functional theory is currently absent at Boncuklu Höyük.

6.3(f) CONTEXT ANALYSIS SUMMARY

It is clear that geometric clay objects are common in both the earlier and later phases of Boncuklu's occupation, across a large range of context types and in all excavated areas of the site. Considering site area, clay objects are particularly frequent and relatively high density within Area H. By phase they decrease in both number and density into the later occupational phases. Within context type, small, geometric clay objects are abundant in middens, yet very low density within these. Of the sixteen spatial, chronological and context type variables, the majority of analysed variables had a low density of clay objects, less than 0.10 objects per litre (figure 6.24). Middens, which have a density of 0.05 overall, show a decrease in density through time (0.08 objects per litre in earlier phases/Area H middens compared to 0.04 objects per litre in the later Neolithic/Area M middens). Only four context types record a density value greater than 0.20 objects per litre, three of which are significantly denser than all other context types: floor surface: 0.92, burial fill: 0.97 and pit-fill: 1.00 objects per litre suggesting that these are the

locations clay objects were primarily used in. There is clear differential distribution in the number and density of clay objects found in certain context types, yet within these, little difference in the nature of clay objects present can be seen. Analysis shows that clay objects tend to be associated with structures, being most dense on floor surface contexts, as well as in pit and burial fills (mainly from inside buildings). In addition, GIS analysis has revealed the clustering of objects within some middens, probably related to specific disposal of groups of objects, whether in floor sweepings or as direct dumping events. Thus, although there are no distinctions between the qualities and characteristics of clay objects being utilised in different areas of the site or phases of its occupation, some indications of diversity according to context type are seen.

6.4-SUMMARY & DISCUSSION

With reference to the research questions, what can be said about the function, role and disposal of clay objects at Boncuklu Höyük? Boncuklu was occupied for up to 1,000 years, yet geometric clay objects are present throughout all Neolithic phases at the site, with little change in the proportion, character or range of objects found. Their use in all occupational phases could suggest their role changed little over the course of this millennium, however, the slight decrease in the density of clay objects from the earlier to the later phases suggests they were perhaps used less frequently in the later phases of settlement. As the objects are crafted from clay-an abundant, locally sourced, ubiquitous raw material and were easily sculpted into simple and often crudely formed geometric shapes, it seems the intrinsic value was not within the objects themselves, but in the meaning imbued in them upon their production and use. This factor, alongside their presence in large quantities at Boncuklu and other contemporary and later settlements, suggests the objects may have had a short life span, being crafted when required and readily disposed of rather than being archived or re-used over a period of time. This is supported by the relatively low proportion of objects displaying signs of excessive wear, while a small number are heavily worn they retain a well-formed, distinct shape. Spheres, ovoids and cones (including sub-types) are very standardized in appearance, yet none of the shapes cover a limited, and regular range of sizes within the parameters of the study size. The analysis above can begin to unravel questions related to who used the objects, where, and for what purpose.

The three most common shapes (as categorised within the broad categories) are spheres, ovoids and discs, which combined constitute over three quarters of all clay objects from the site. The dominance of these three shapes changes little across phases,

and content type. Focusing on context type, the majority of clay objects come from external contexts, with the greatest concentration of objects from middens (n=266). This large proportion of midden objects makes it difficult to quantify the exact number of households that may have used "tokens", and for what purpose. Boncuklu middens were extensive, versatile spaces, certainly including material swept out of the interior of buildings, yet a far greater proportion of midden material represents refuse from other sorts of *in situ* (i.e. open air, external) activity performed communally presumably. In addition to the midden evidence, the presence of objects from the "floor contact" context type, is clear evidence of the utilisation of clay objects within the private space of the home. Burial fill (almost always inside buildings) and pit-fill contexts have amongst the highest density of clay objects. However, these contexts, especially burial fill, may represent the accidental deposition of geometric clay objects within fill, likely if midden material was used to fill burials and pits or if refuse lying on the floor surface was also accidentally incorporated into the fills of adjacent burial cuts and pits.

The study of specific buildings containing clay objects shows that all buildings at Boncuklu contain at least one clay object, though this is not to say that each and every Boncuklu resident used the objects, nor that every household contained an object at all times as the buildings were not all simultaneously occupied. Interestingly, buildings that contain ten or more clay objects display near identical "sets"; dominated by spheres, ovoids and discs which combined comprise around three quarters of "house" assemblages. The same three shapes dominate midden assemblages. This suggests that these three main shapes functioned together as sets of objects, with shape being the distinguishing feature. Sets of objects with three variables could be useful in gaming, yet would be equally useful in simple accounting (i.e. counting). Three different forms of objects would not be necessary if the objects were merely used to count, or in one-to-one correspondence; suggesting a slightly more complex role for these objects, at least as they functioned within the domestic space. This is interesting due to the limited evidence for permanent, moderate to large scale storage at Boncuklu Höyük (although there is abundant indirect evidence for basketry, see Chapter 4.1). New research underway by Lori Hager (Pacific Legacy, Inc., Berkeley, CA and the Archaeological Research Facility, University of California, Berkeley) is attempting to use fingerprint analysis to investigate the age and gender of those involved in the production of clay objects at Boncuklu Höyük. Provisional results of a pilot study (15 samples) suggest the role was dominated by females and juveniles (Hager pers. comm.).

ILLUSTRATIONS

FIGURES:

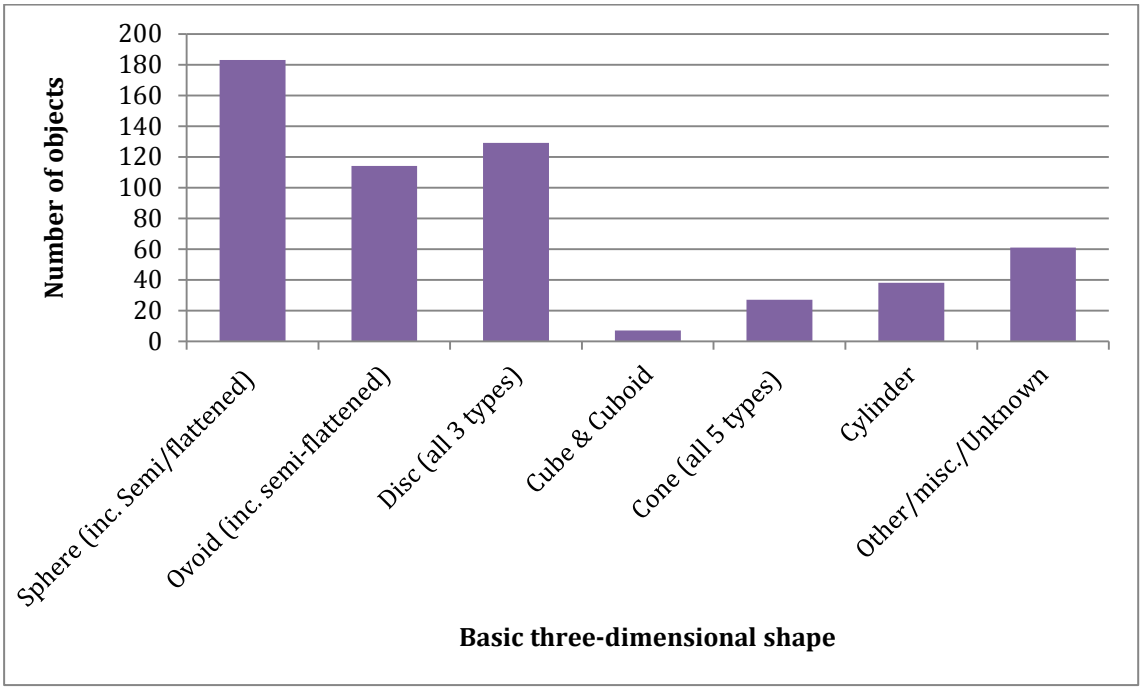


Figure 6.1: Range of basic three-dimensional shapes covering seven predefined basic "types".

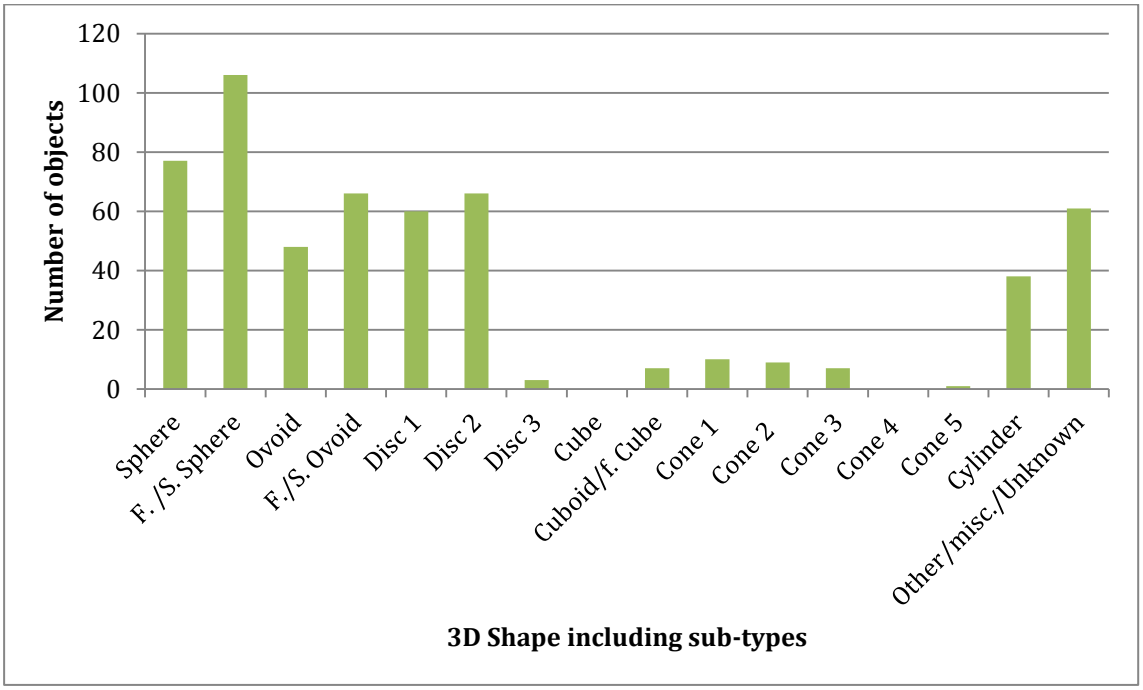


Figure 6.2: Range and number of objects of each three-dimension shapes-including "sub-types" (a total of 16 possible options are available, 14 of which are represented in the Boncuklu assemblage).

Figure 6.3: Example of objects with impressions. **(Top)** CO# 1347, **(middle)** CO# 2785 and **(bottom)** CO# 656. (Photographs: author's own).

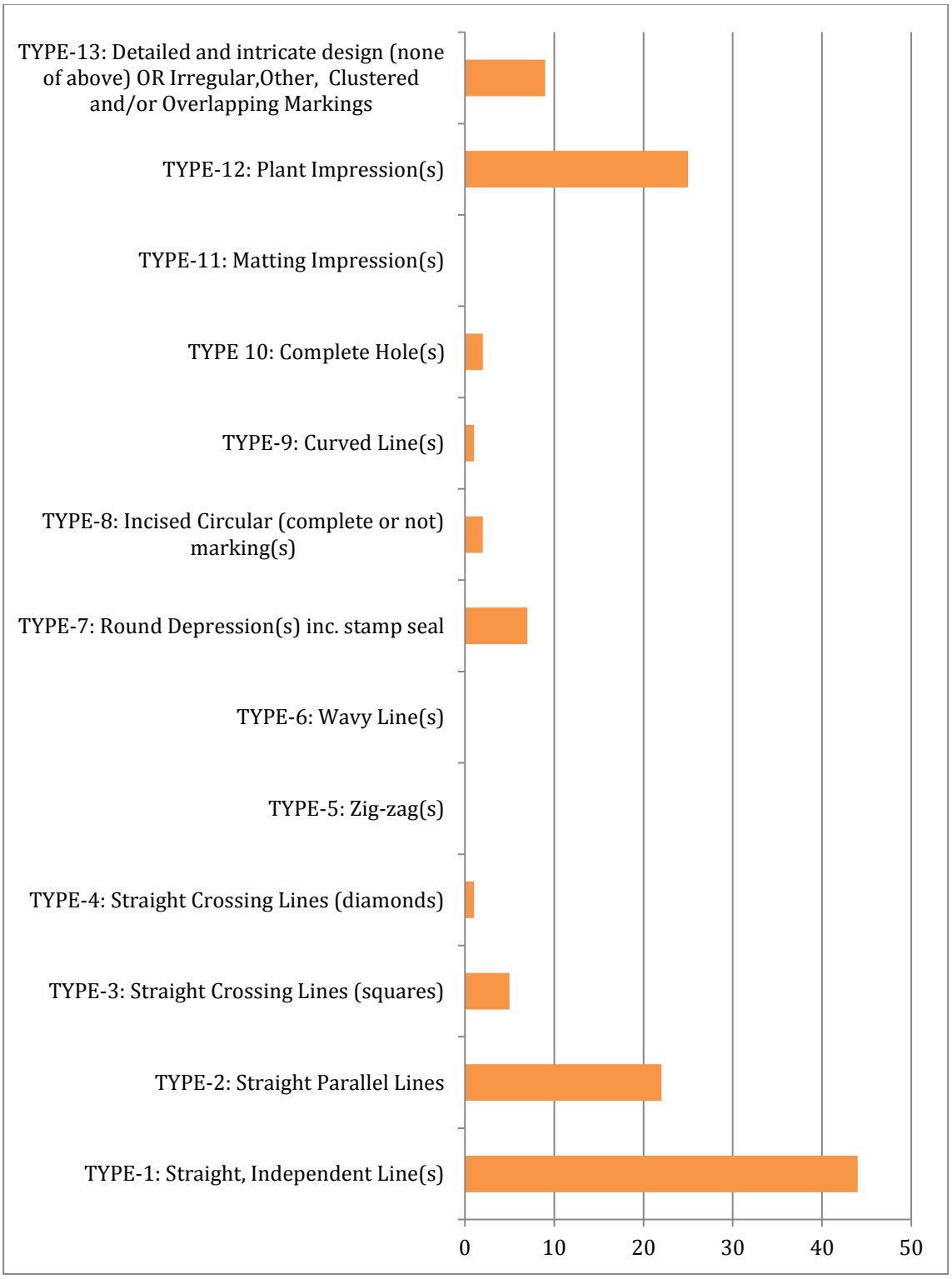


Figure 6.4: Range of marking forms, and dominance of each type (number of objects displaying at least each marking type).

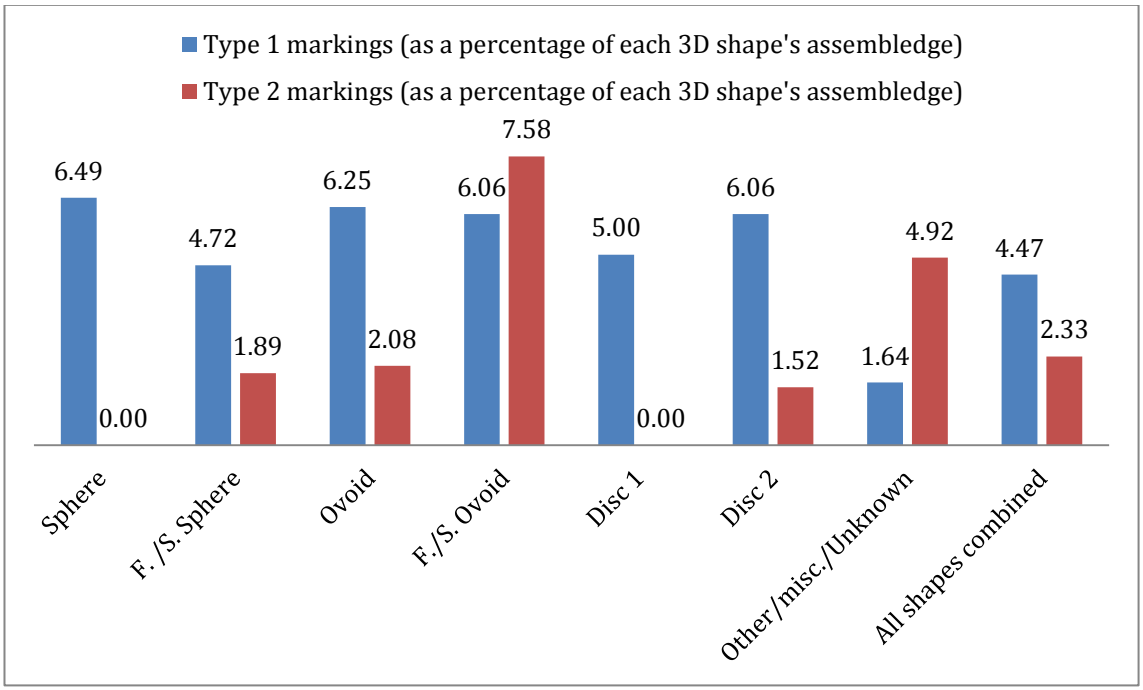


Figure 6.5: Distribution the two most common marking forms (type 1: straight, independent line(s) only and type 2: straight parallel lines only) across the most common three-dimensional shapes. The percentage of objects of each marking within each shape is displayed.

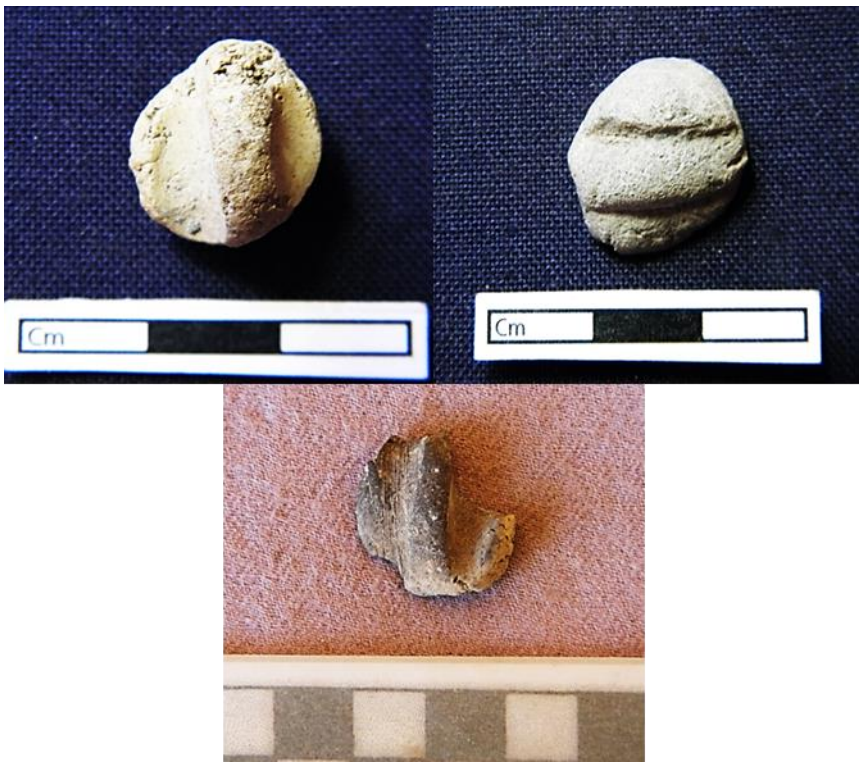


Figure 6.6: Three different objects, each displaying similar markings, size, colour and shape. Left to right: CO#s 1508, 871 and 1465. (Photographs: author's own).

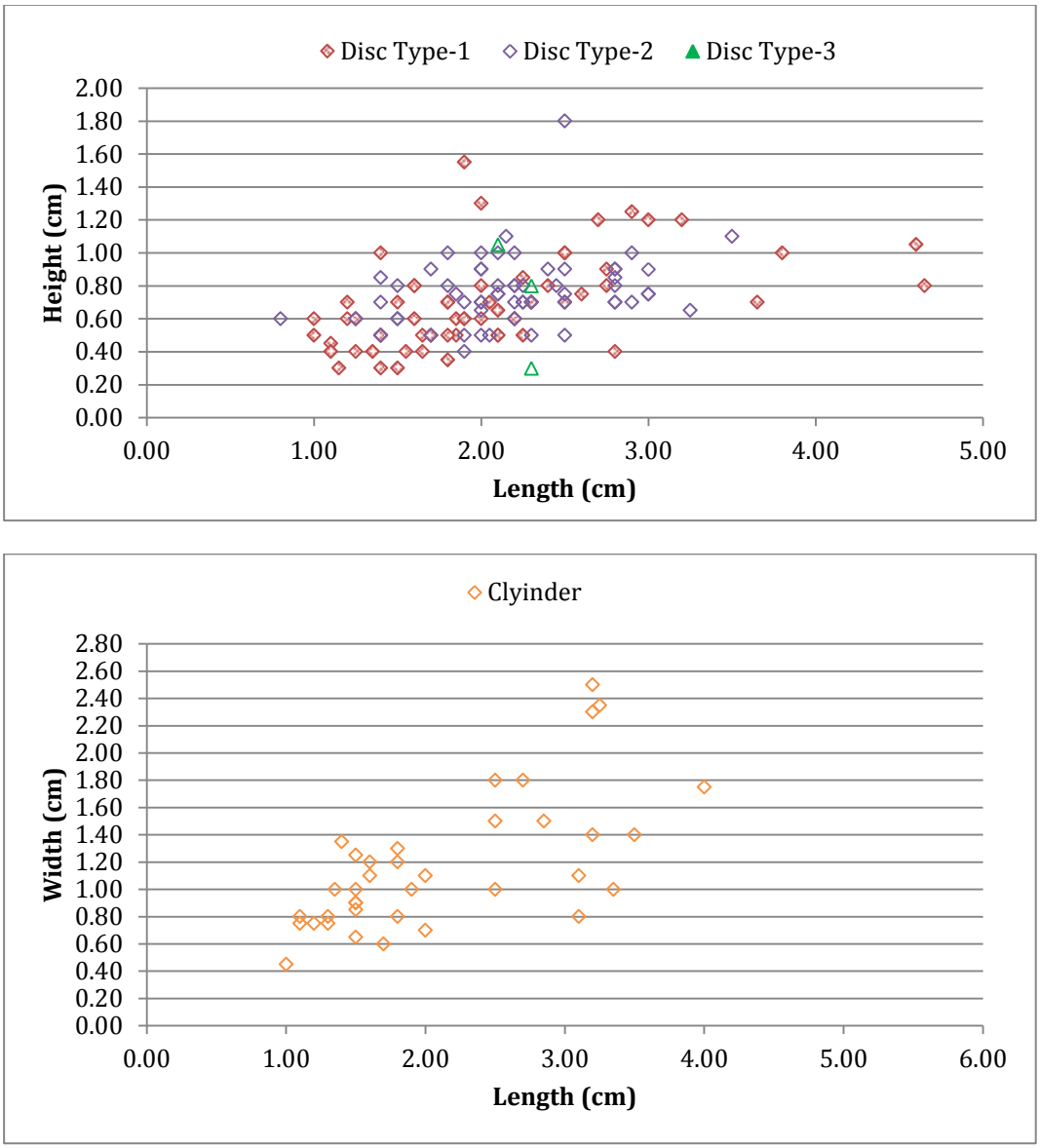
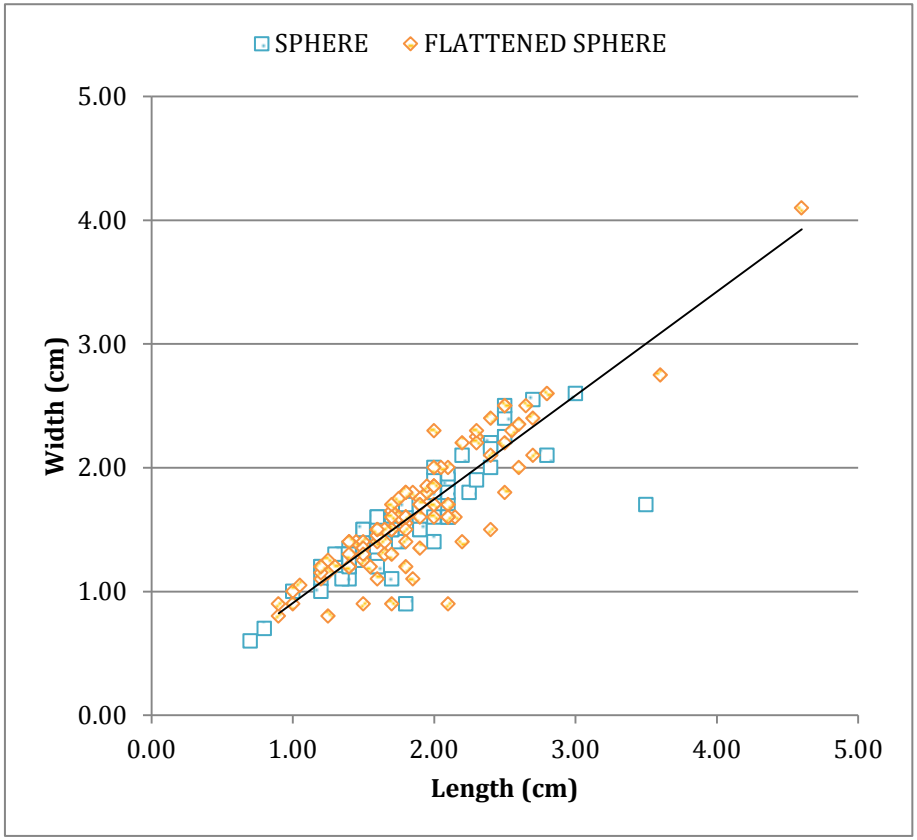


Figure 6.7: Three-dimensional shape standardization at Boncuklu Höyük: comparison of object size, and the ration of various measurements showing the degree of overall shape standardization and the range of sizes represented by sleeted three-dimensional shapes. **(Top)** Little correlation is seen between disc length and thickness, not the clustering of discs within any particular size range within any of the three disc sub-types. **(Bottom)** Cylinders show a similar lack of standardization of either shape refinement or size range.


SPHERE
FLATTENED SPHERE
5.00
4.00
3.00
2.00
1.00
0.00
Width (cm)
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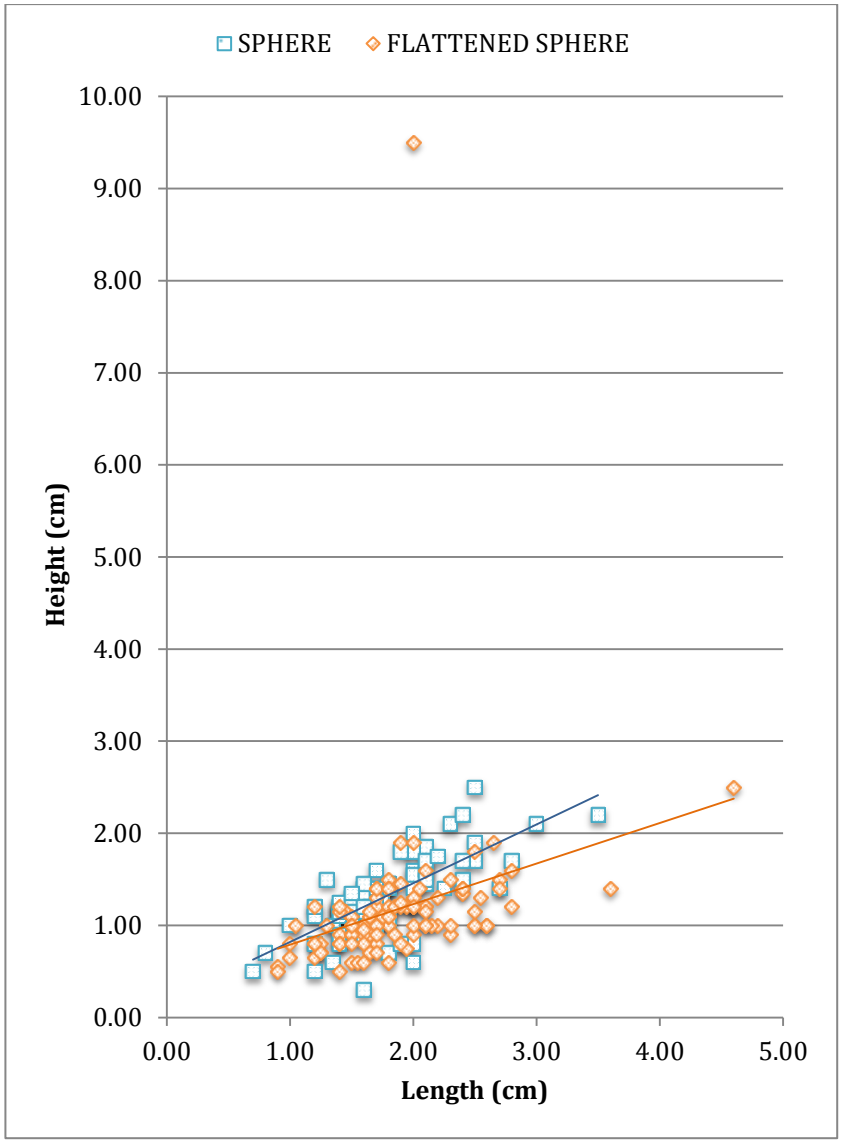
Length (cm)


SPHERE
FLATTENED SPHERE
10.00
9.00
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6.00
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4.00
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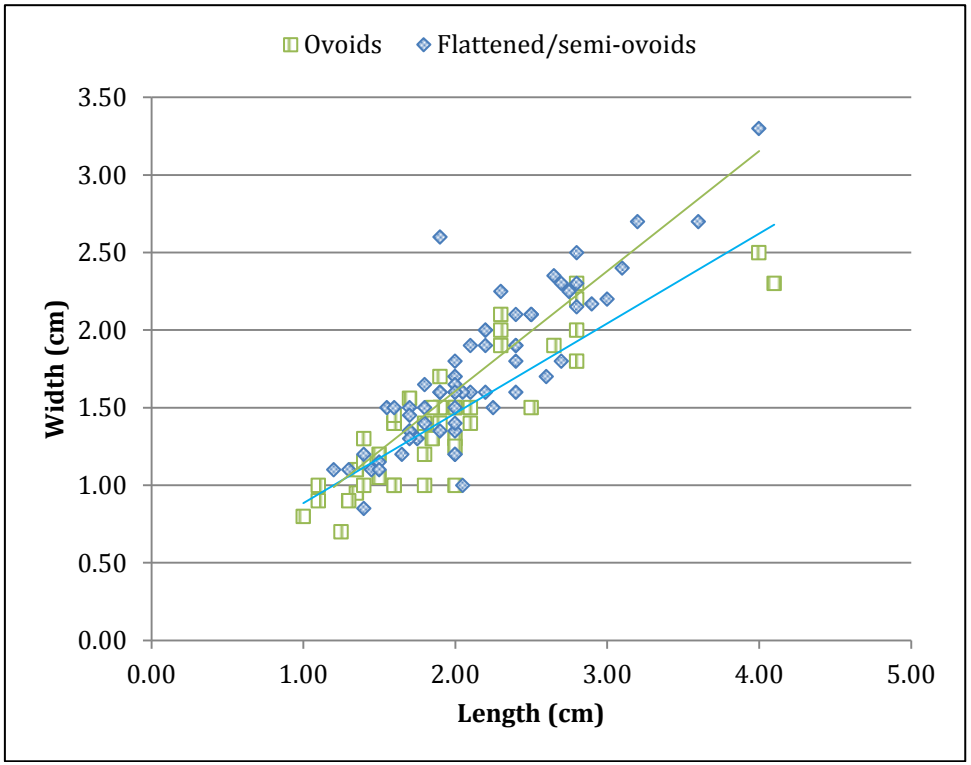
Length (cm)



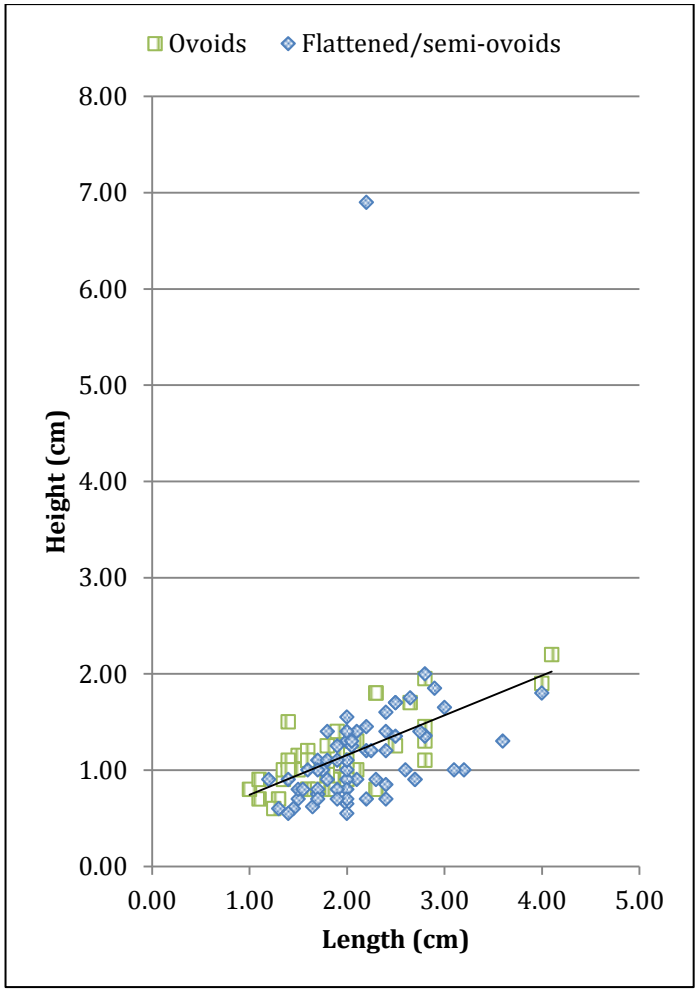


Figure 6.8: Boncuklu shape standardization. **(Previous page)** Spheres contrasted to flattened/semi spheres and **(this page)** ovoids contrasted to flattened/semi-ovoids: length vs. width and (**left)** length vs. height **(right)**.

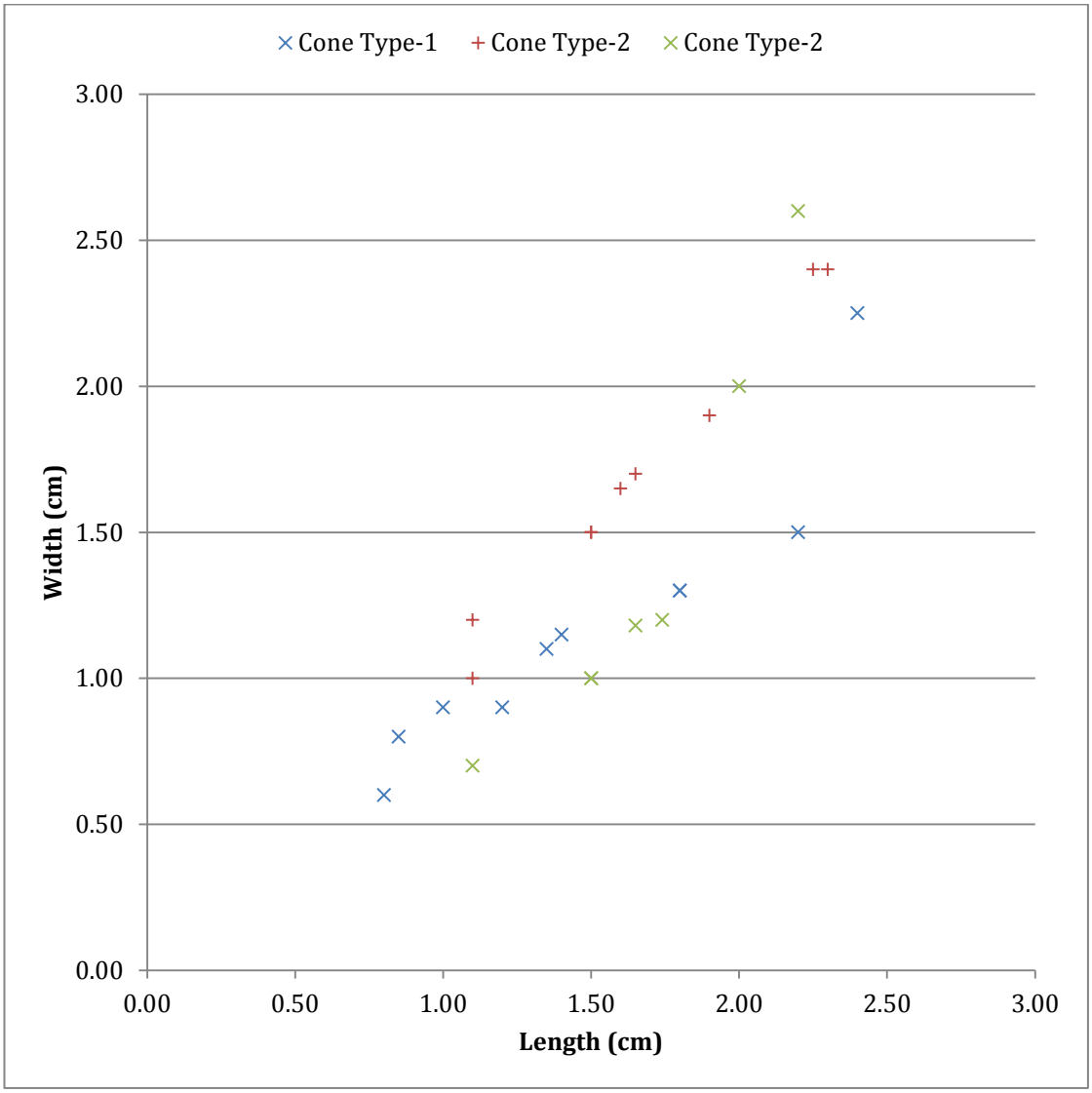


Figure 6.9: Boncuklu cone standardization: ratio of measurements (height and base maximum diameter or width) and range of sizes of the three cone sub-types represented at Boncuklu.

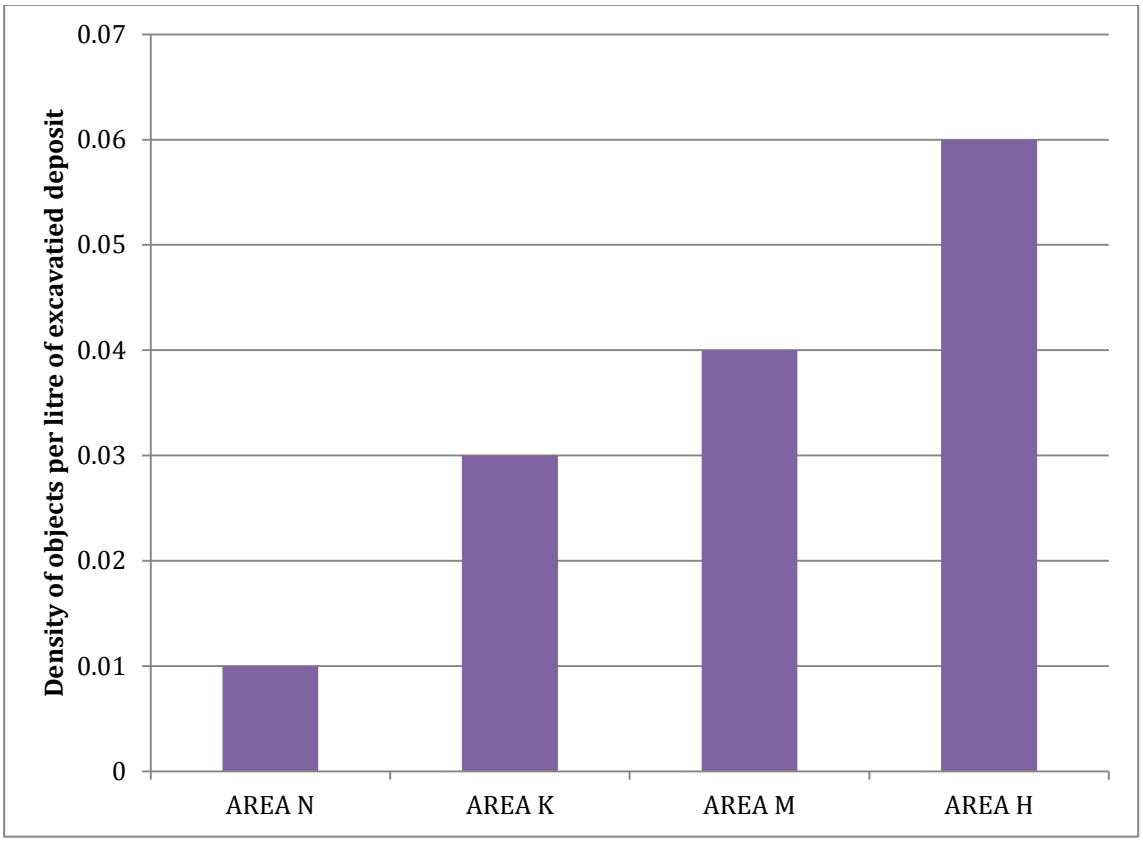


Figure 6.10: Density of small geometric clay objects (per litre of deposit excavated) across the main four areas.

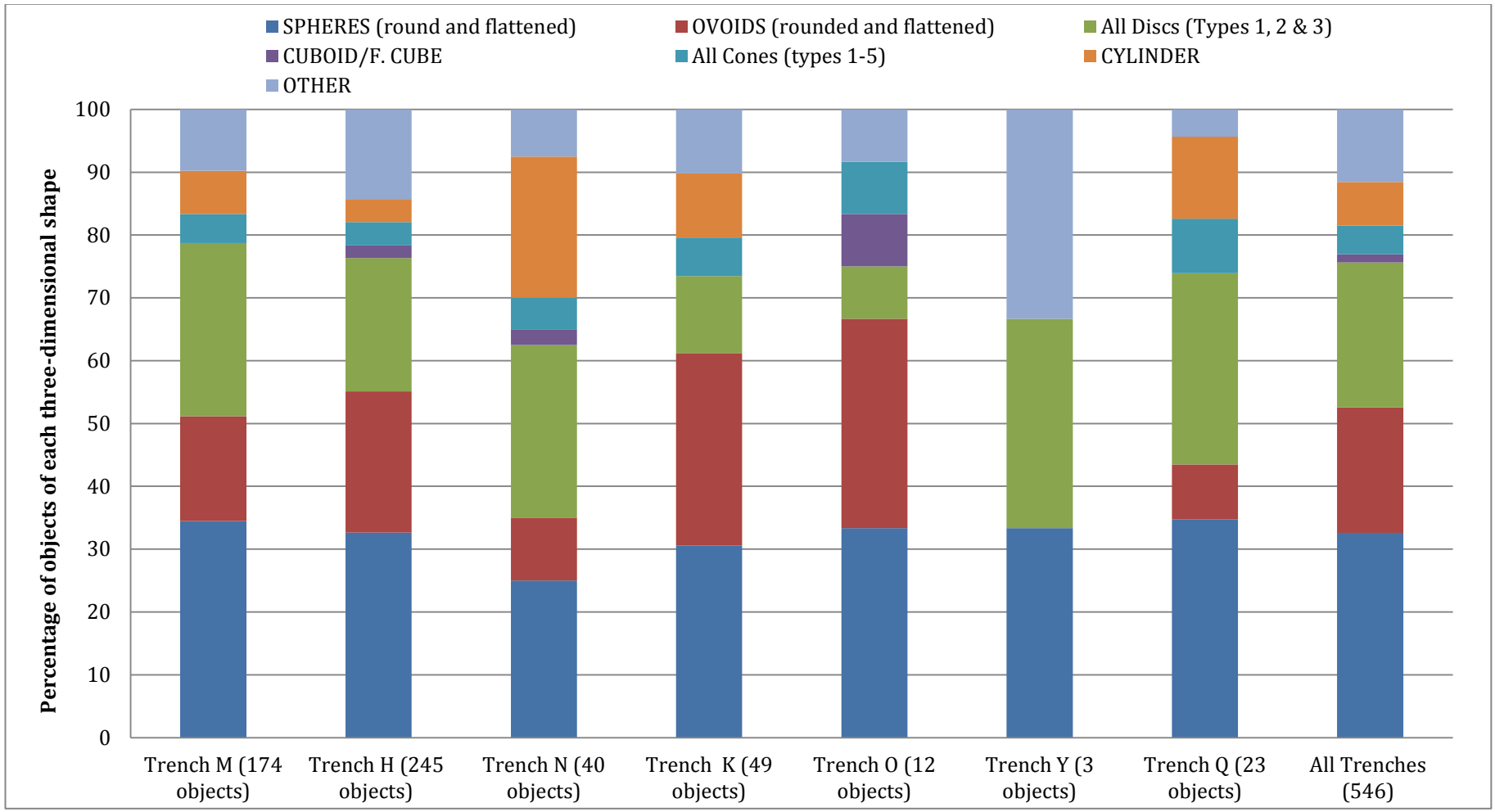


Figure 6.11: Proportion of each of the main three-dimensional geometric shapes as distributed across each excavated area of the site.

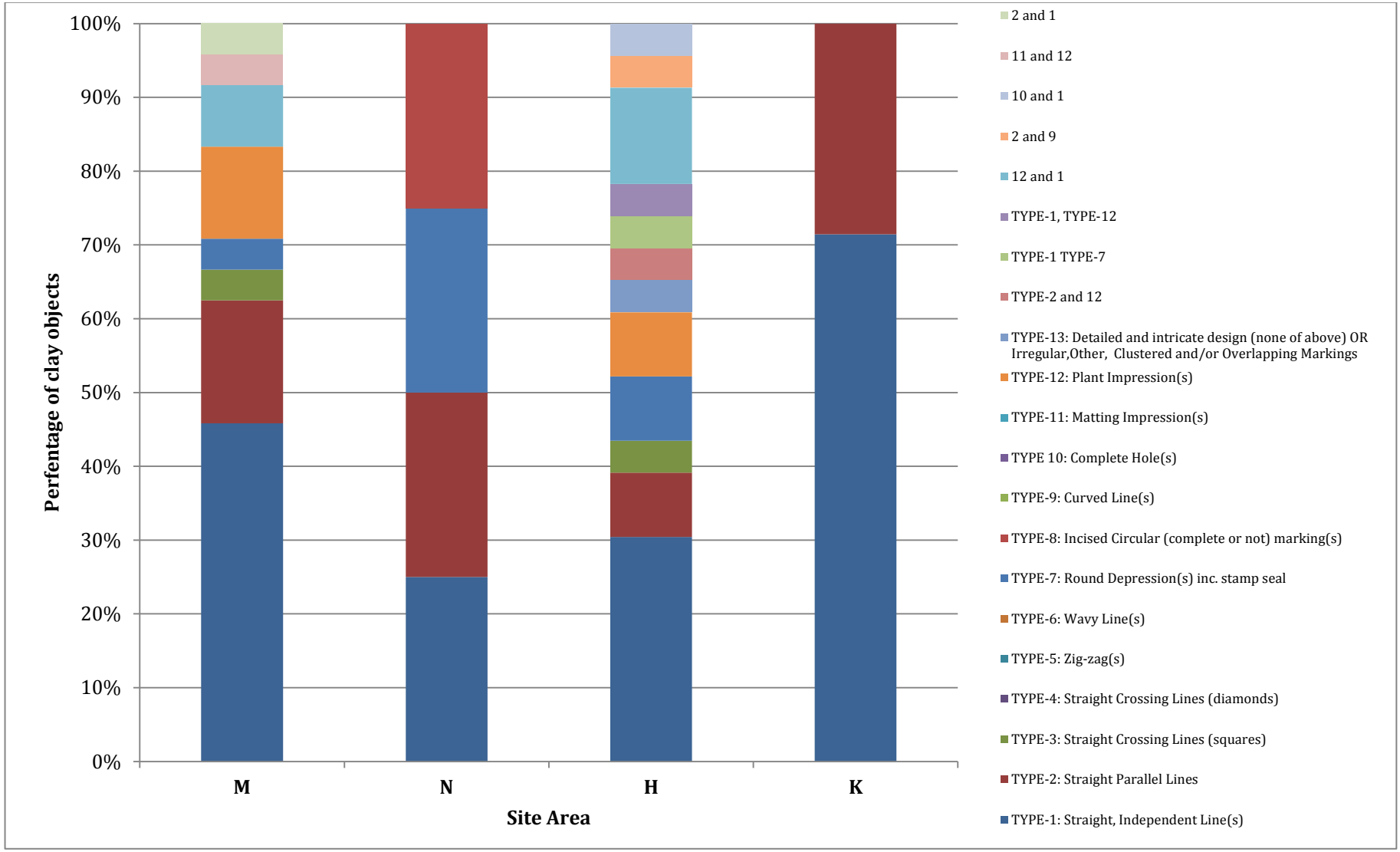


Figure 6.12: Range and diversity of marking types found on objects across the four main excavation areas. Areas K and N contain marked objects of only two designs, while the objects within areas M and H have a much wider range of designs.

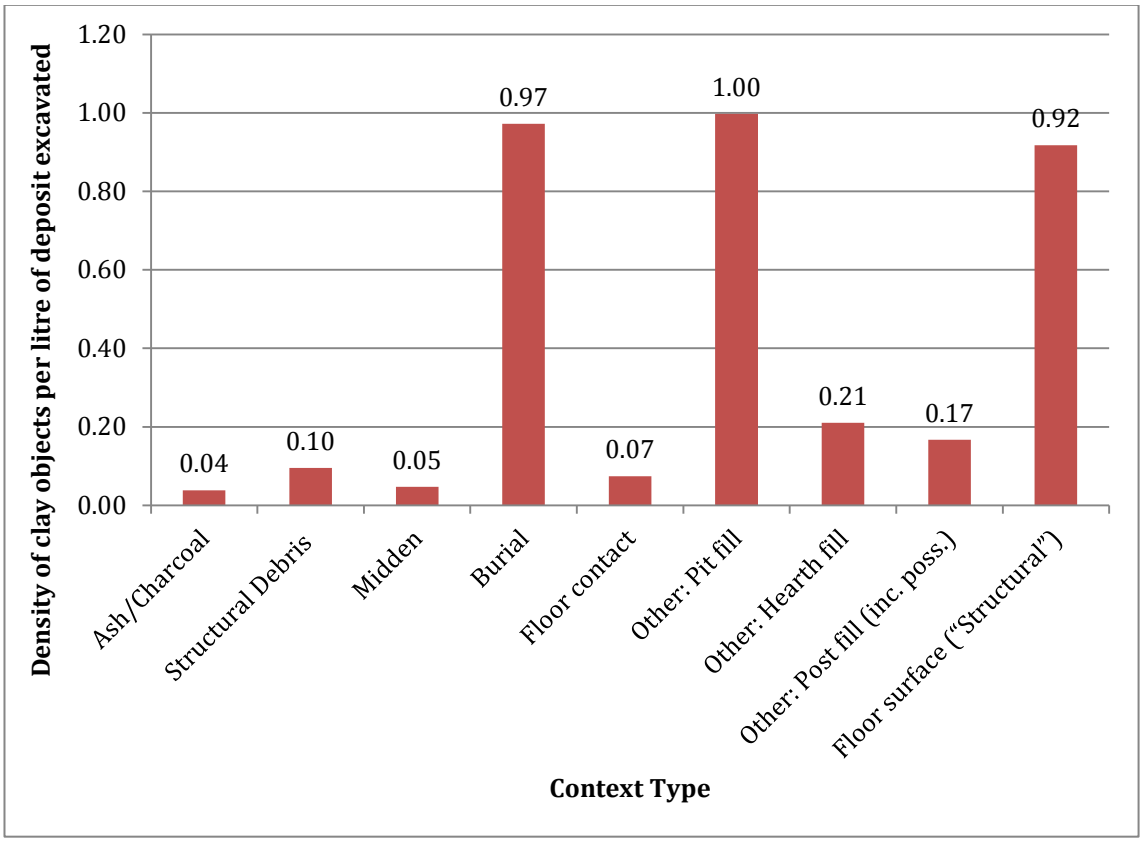


Figure 6.13: Density of geometric clay objects (number of objects per litre) within the main 9 types of context.

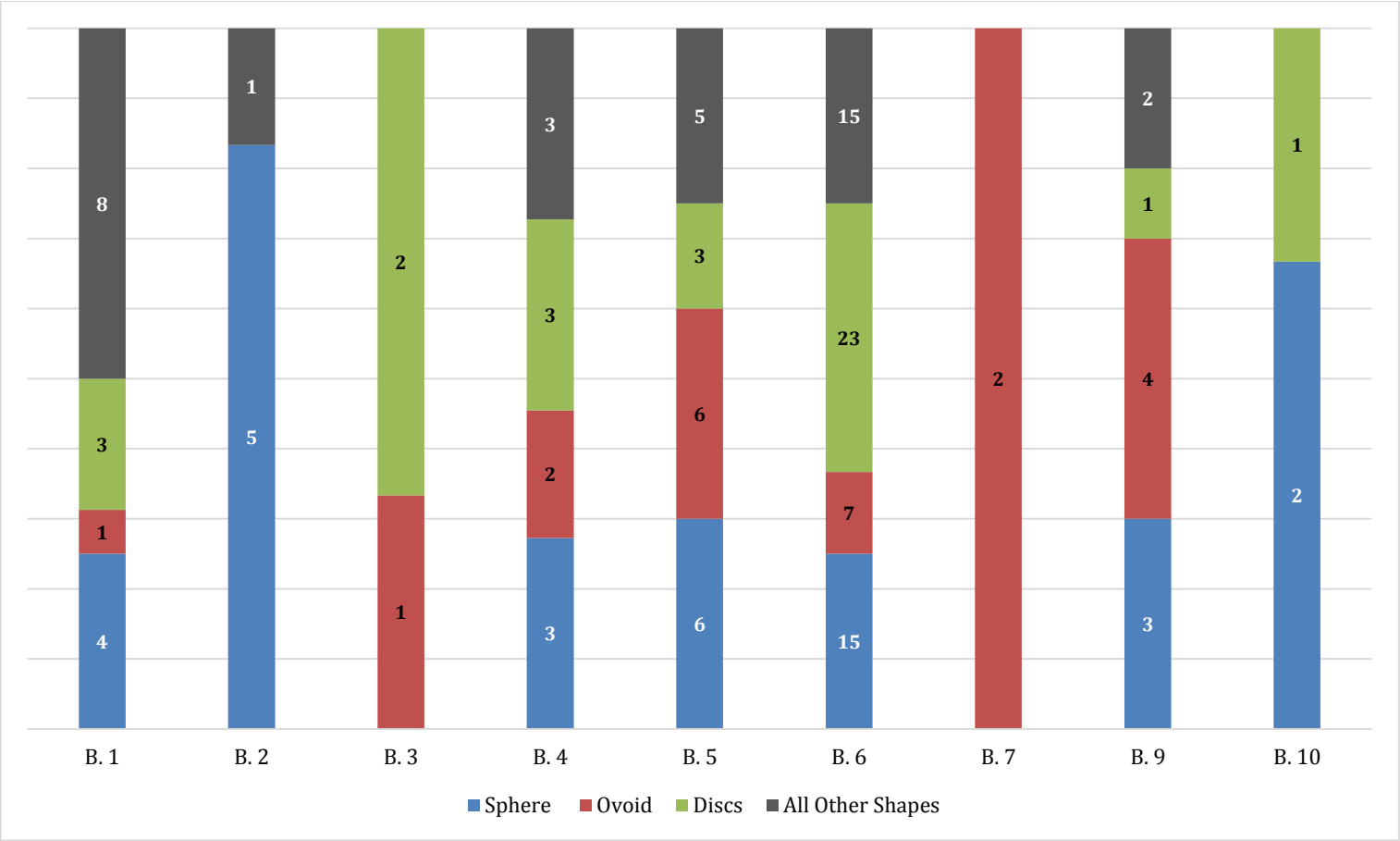


Figure 6.14: Number of clay objects within buildings, according to the most common broad three-dimensional shapes (spheres, ovoids and discs) and all other shapes combined.

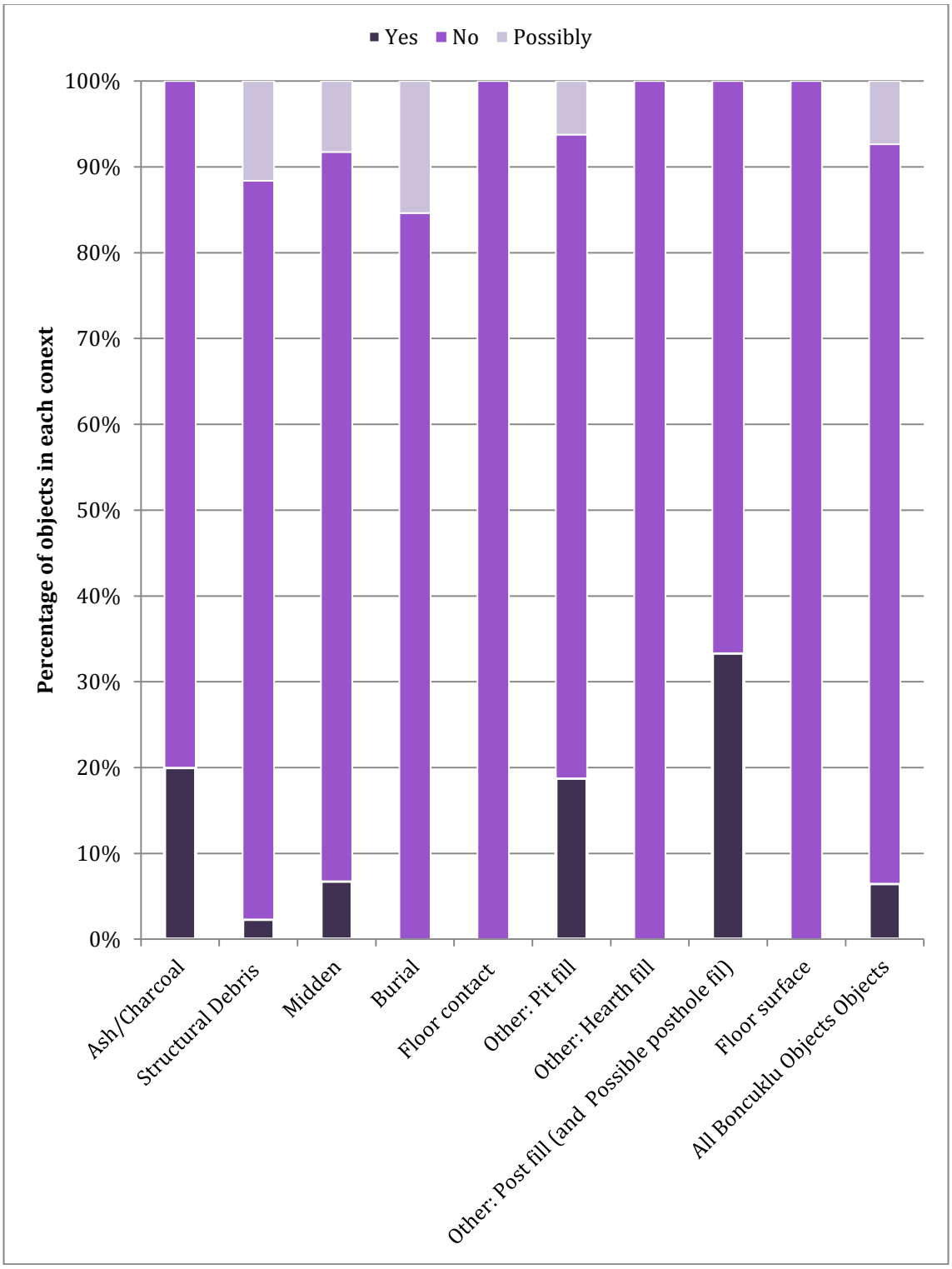


Figure 6.15: Comparison of the proportion of burnt and non-burnt objects within and across each different context type, compared to the overall proportions (far right).

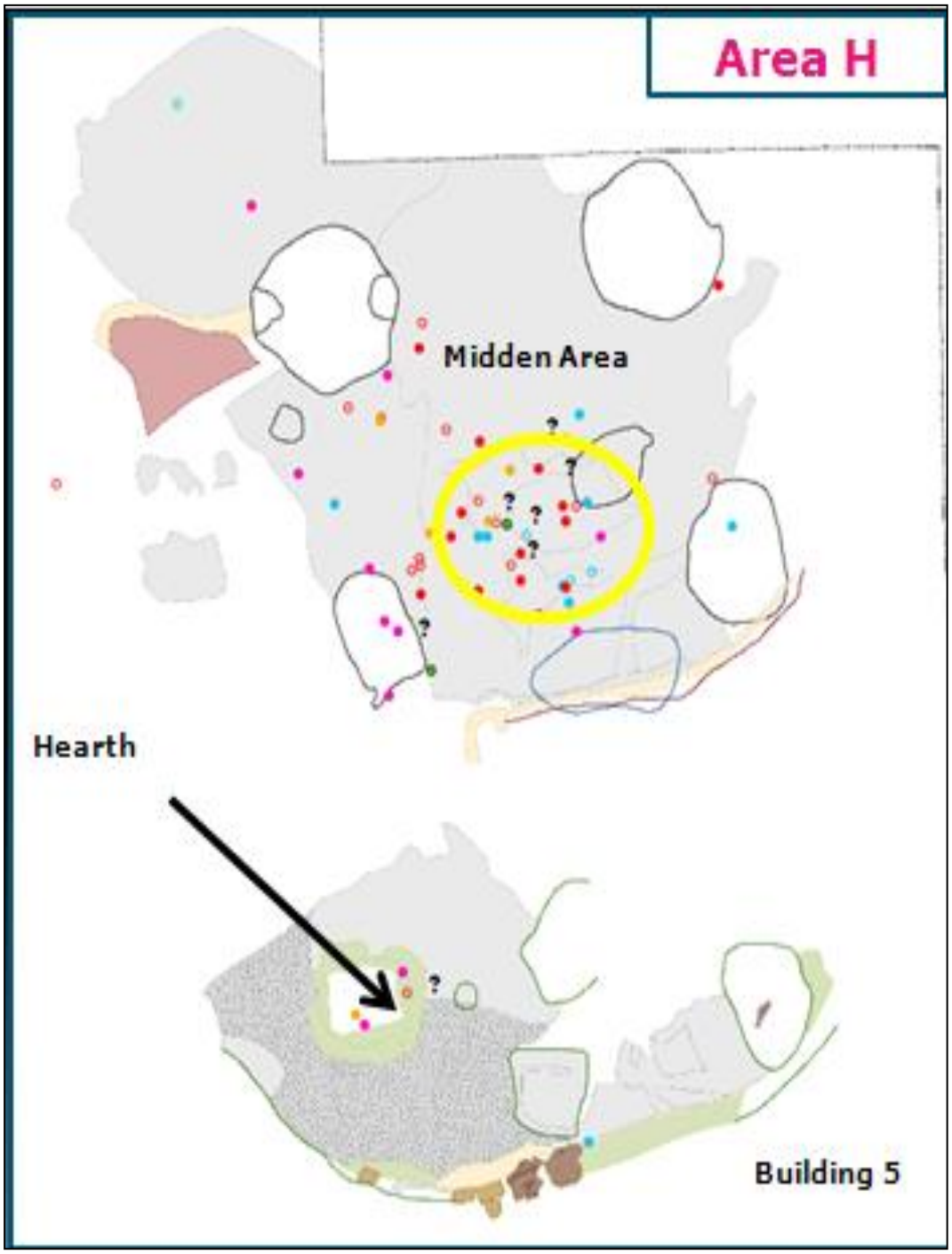


Figure 6.16: Plan of Area H at Boncuklu Höyük, showing the clustering of geometric clay objects within one area of the midden (above), and on the edge of a hearth within the shell of Building 5. Within the midden area (top), flattened ovoids (hollow round blue icons) and flattened spheres (hollow round reds) dominate. (Images by Dana Campbell, courtesy of the Boncuklu Höyük Project).

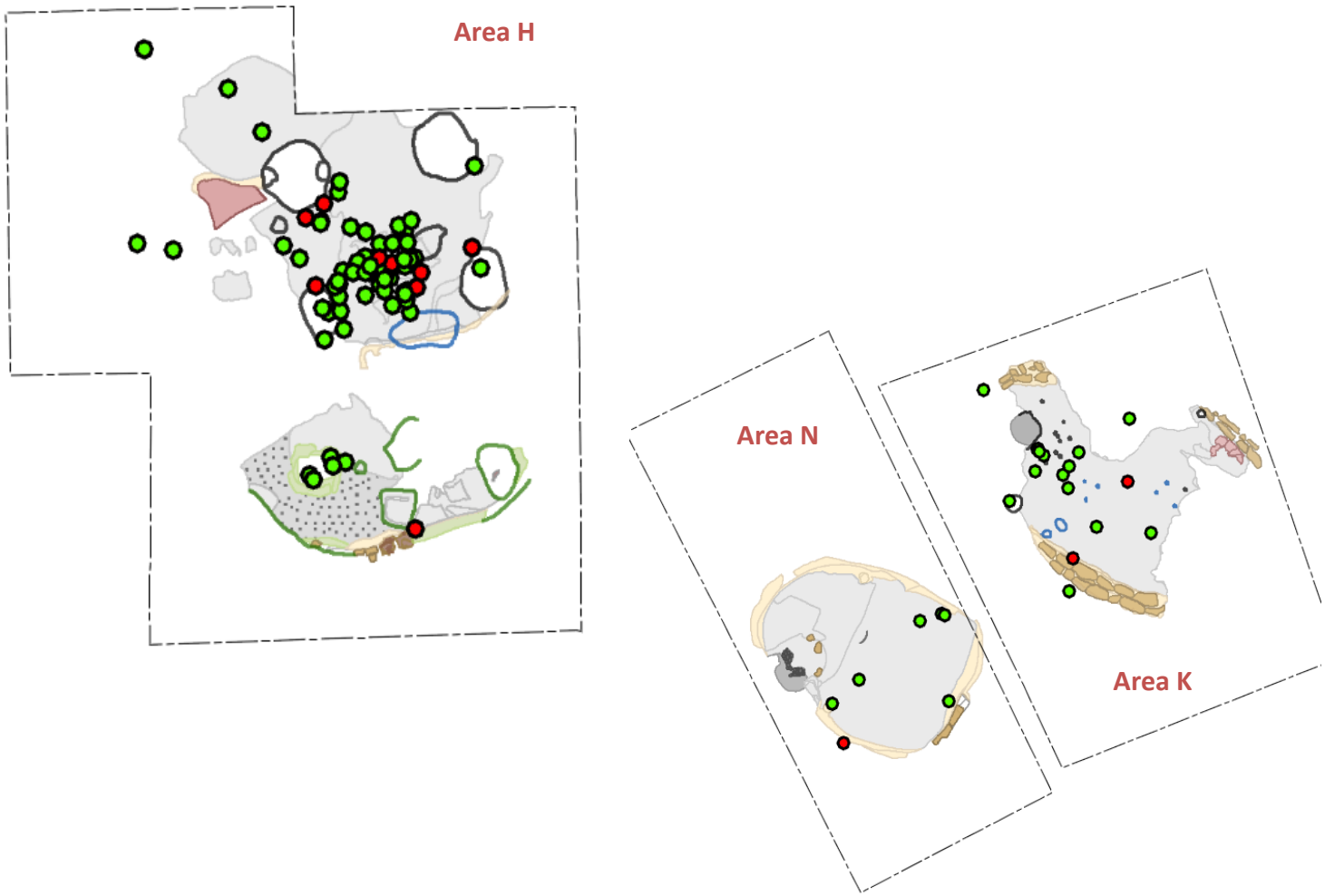


Figure 6.17: Schematic plan of Areas H, N and K at Boncuklu Höyük (see Chapter 4.1 for site plan) highlighting the distribution of objects with impressions (pink) which are rare in general at Boncuklu Höyük. Where present, they cluster as seen in area H in comparison to Areas N and K. (Images by Dana Campbell, courtesy of the Boncuklu Höyük Project).

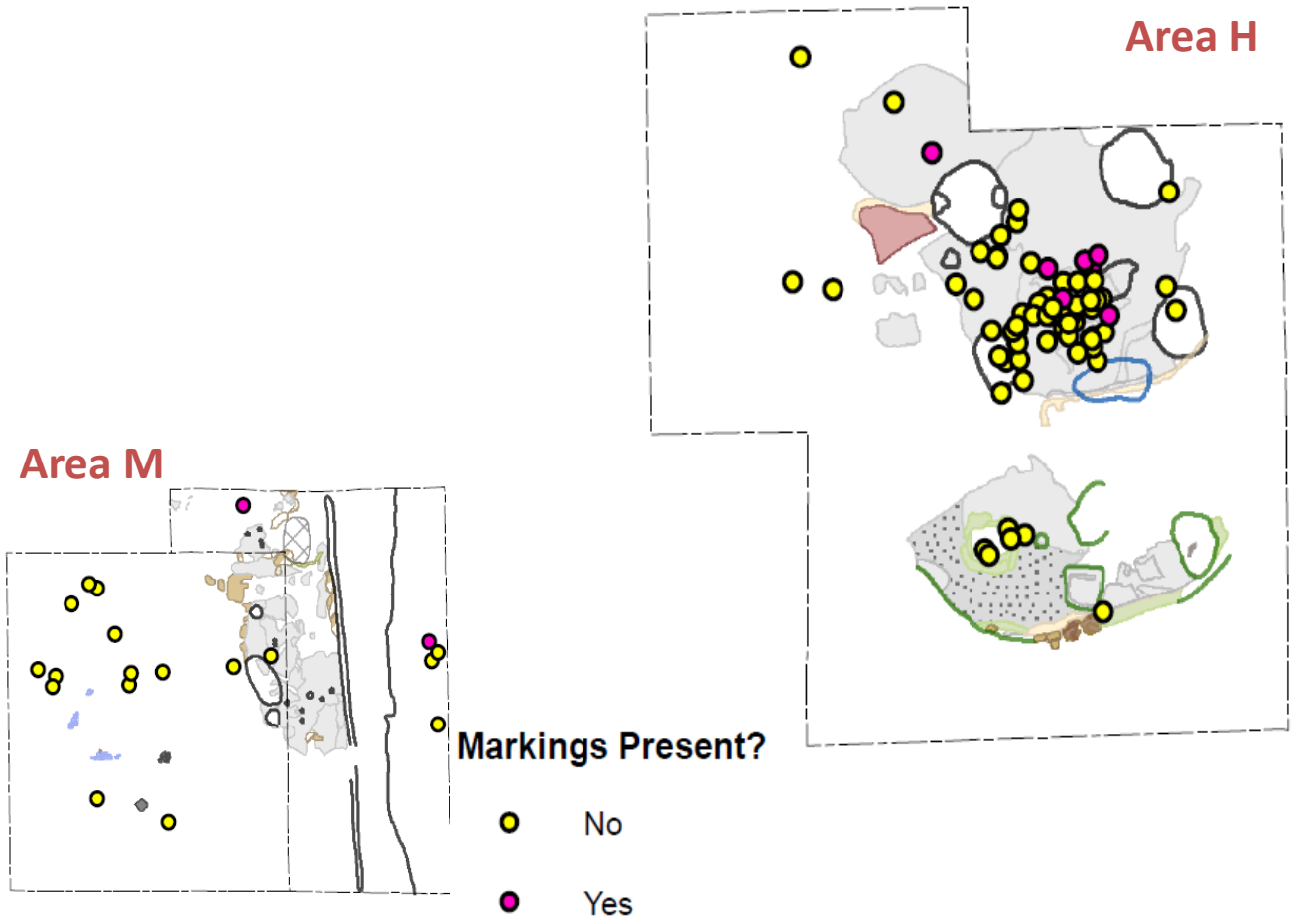


Figure 6.18: Plan of Areas M and H at Boncuklu Höyük (see Chapter 4.1 for site plan) showing the distribution of objects with intentional, decorative markings (darker icons) which cluster in one area of area H midden, in contrast to the more sparse, and random distribution of the objects (mainly unmarked, lighter icons) within area M. (Images by Dana Campbell, courtesy of the Boncuklu Höyük Project).

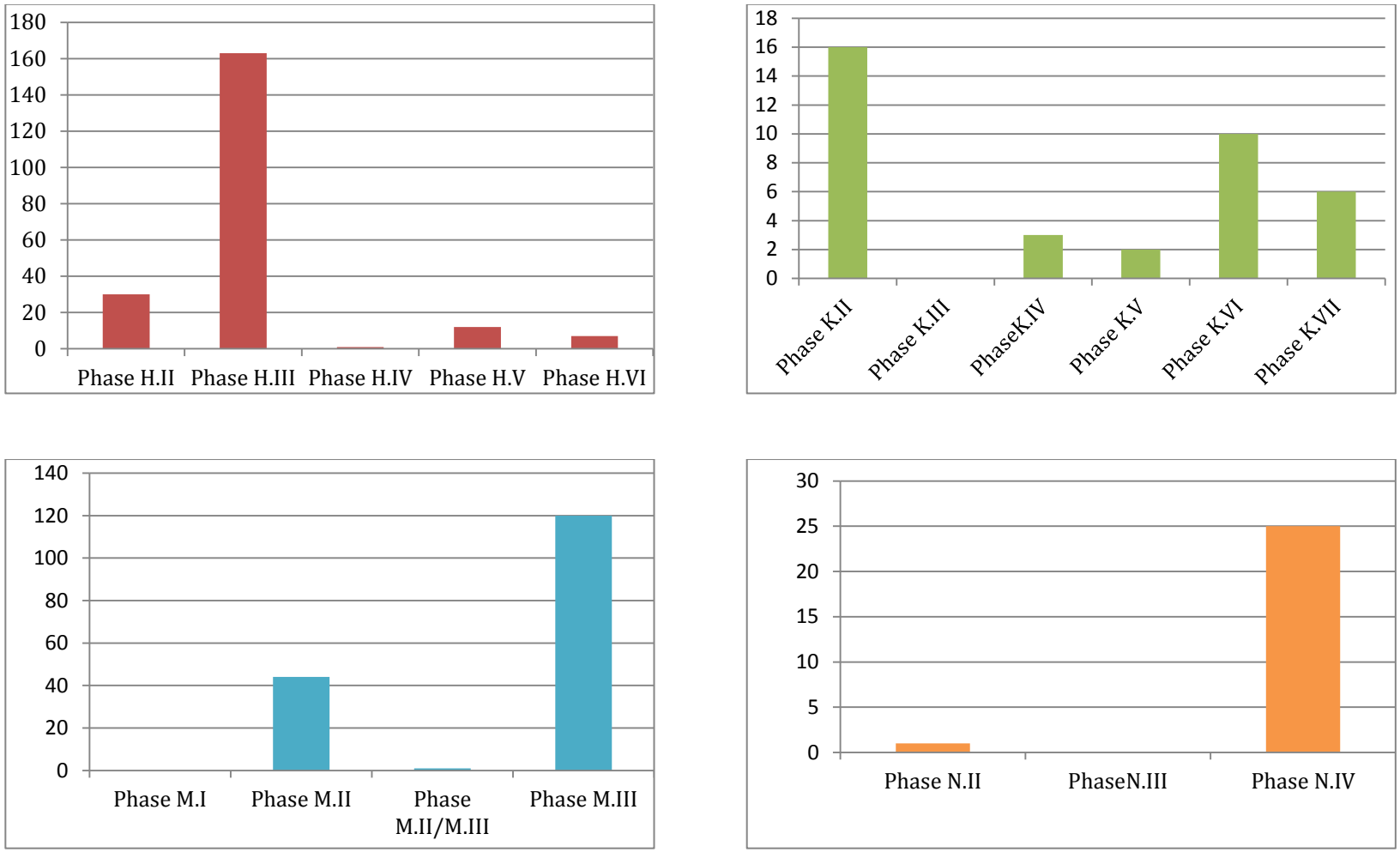


Figure 6.19: The number of objects within each Neolithic phase of occupation within Boncuklu's main excavation areas: top left Area H, top right Area K, bottom left Area M, bottom right Area N.

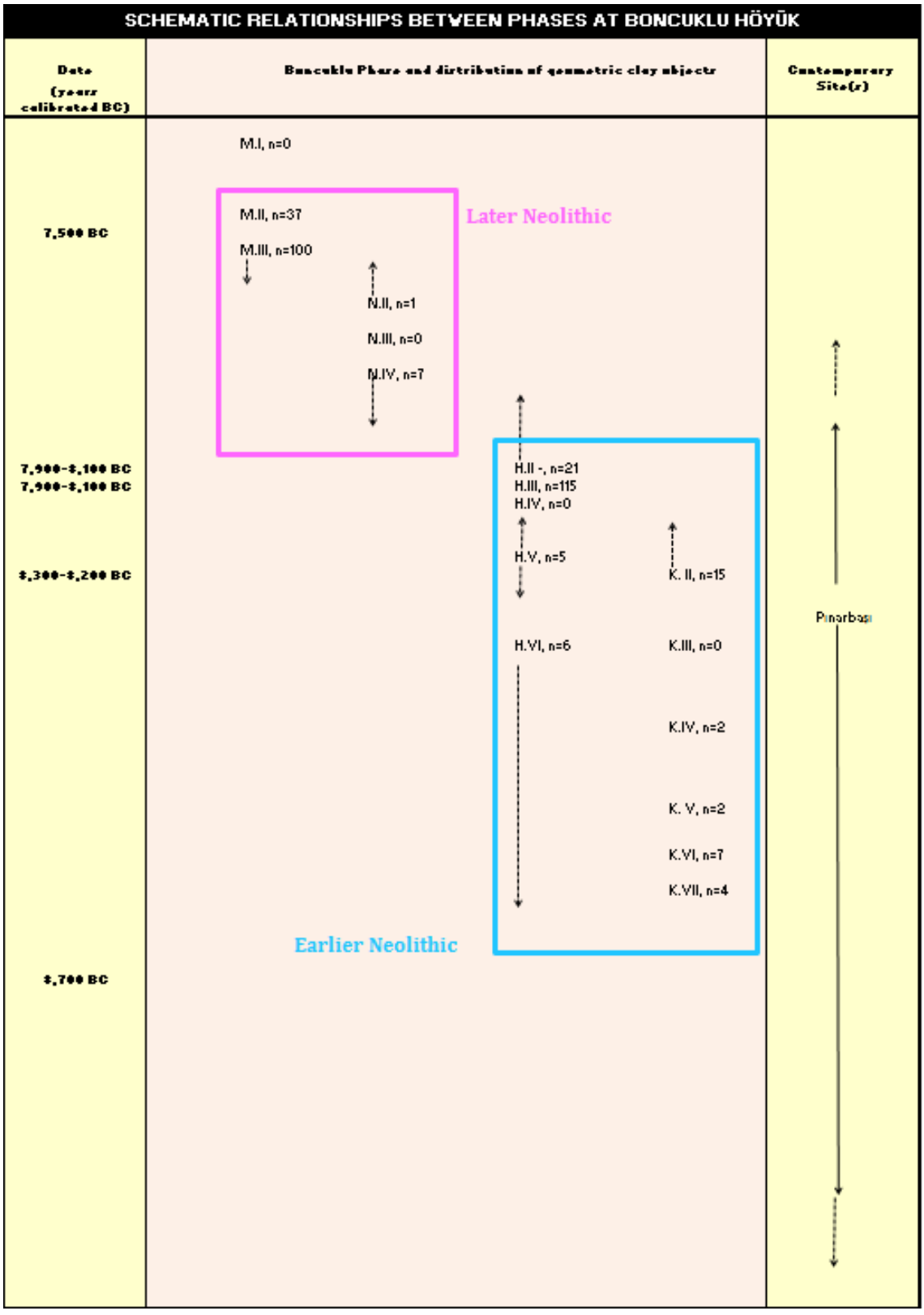


Figure 6.20: Occupational phases represented within different excavated areas of the site, grouped into two broad Neolithic occupation phases: the *earlier* Neolithic (c. 8,400-7,900 cal. BC) and the *later* Neolithic (post c. 7,900 cal. BC, until approximately 7,500 cal. BC.). Number of clay objects recovered per phase within each area is marked.

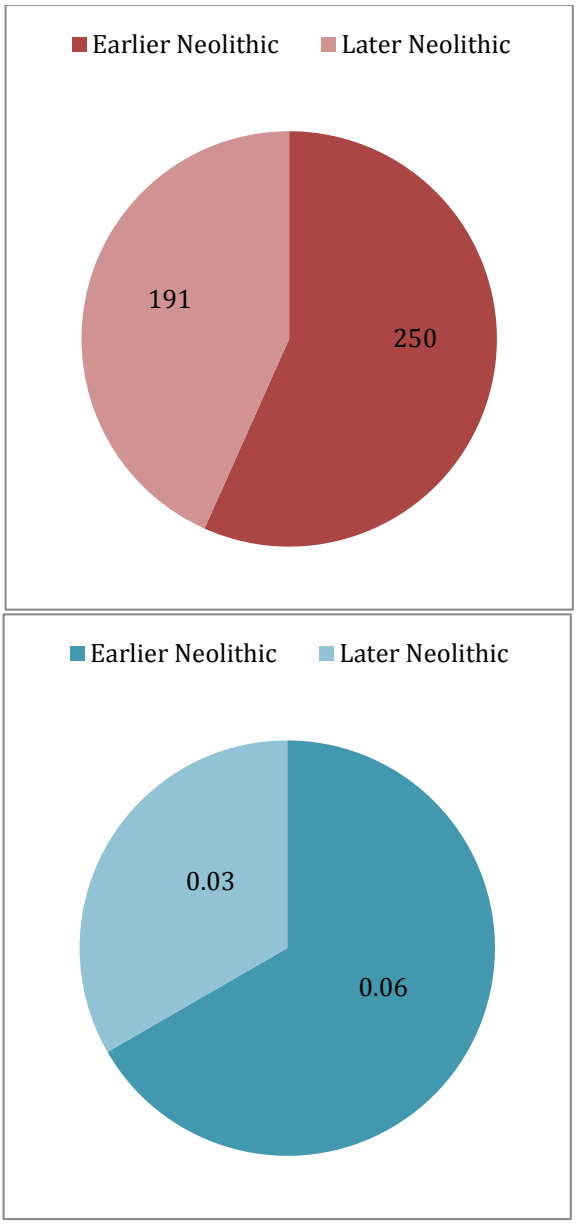


Figure 6.21: Number and density of clay objects from Boncuklu's two broad phases of Neolithic occupation; *earlier* and *later* Neolithic. **(Top)** *Number* of objects by broad phase (n=250/ 44.72% *earlier* vs. n=191/ 34.17% *later*). **(Right)** *Density* of clay objects per litre within each phase.

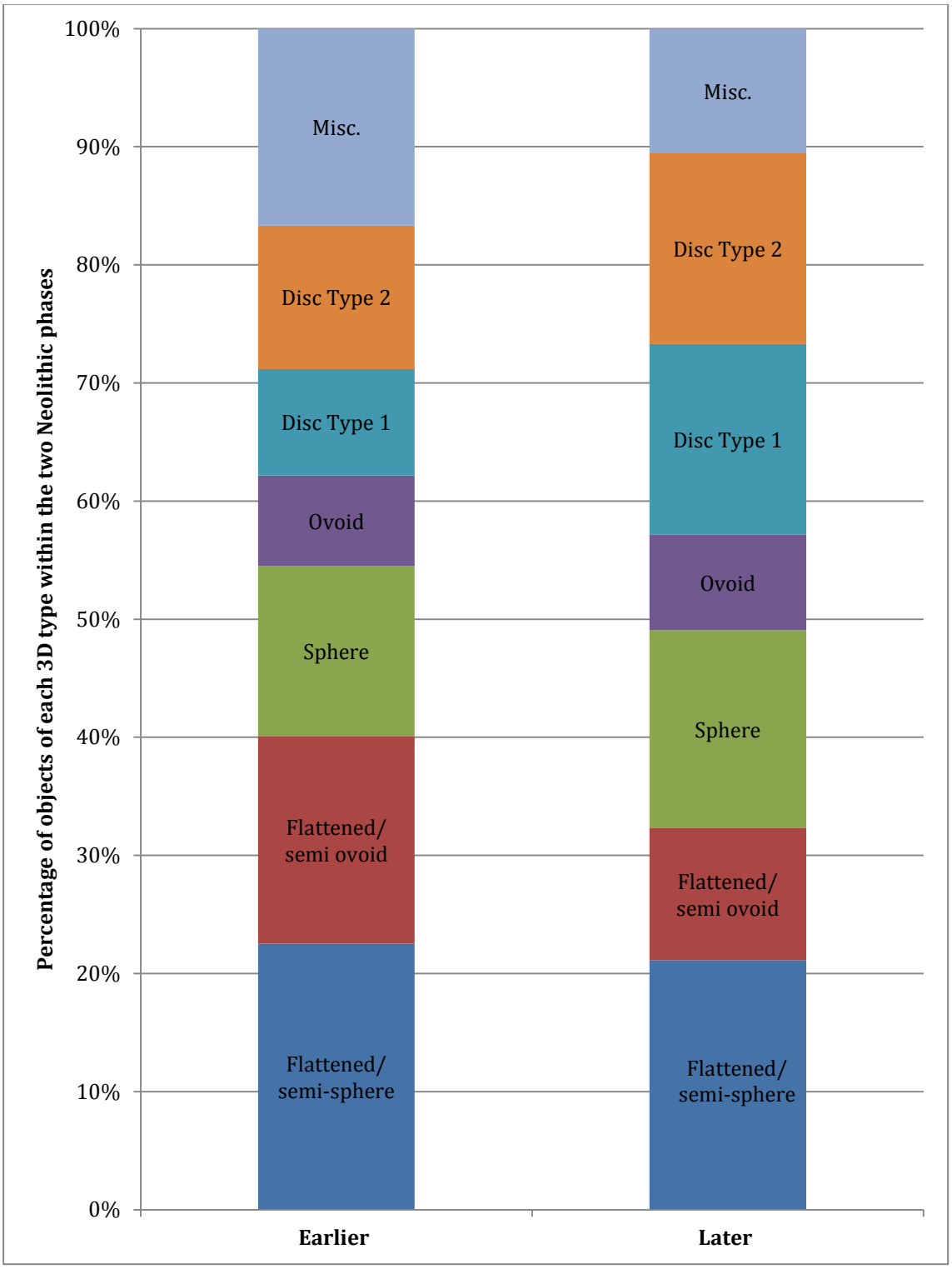


Figure 6.22: Comparison of the number and proportion of the main, detailed three-dimensional shapes within the broad *earlier* and *later* Neolithic occupation phases. The same shapes dominate both assemblages, yet are found in different proportions.

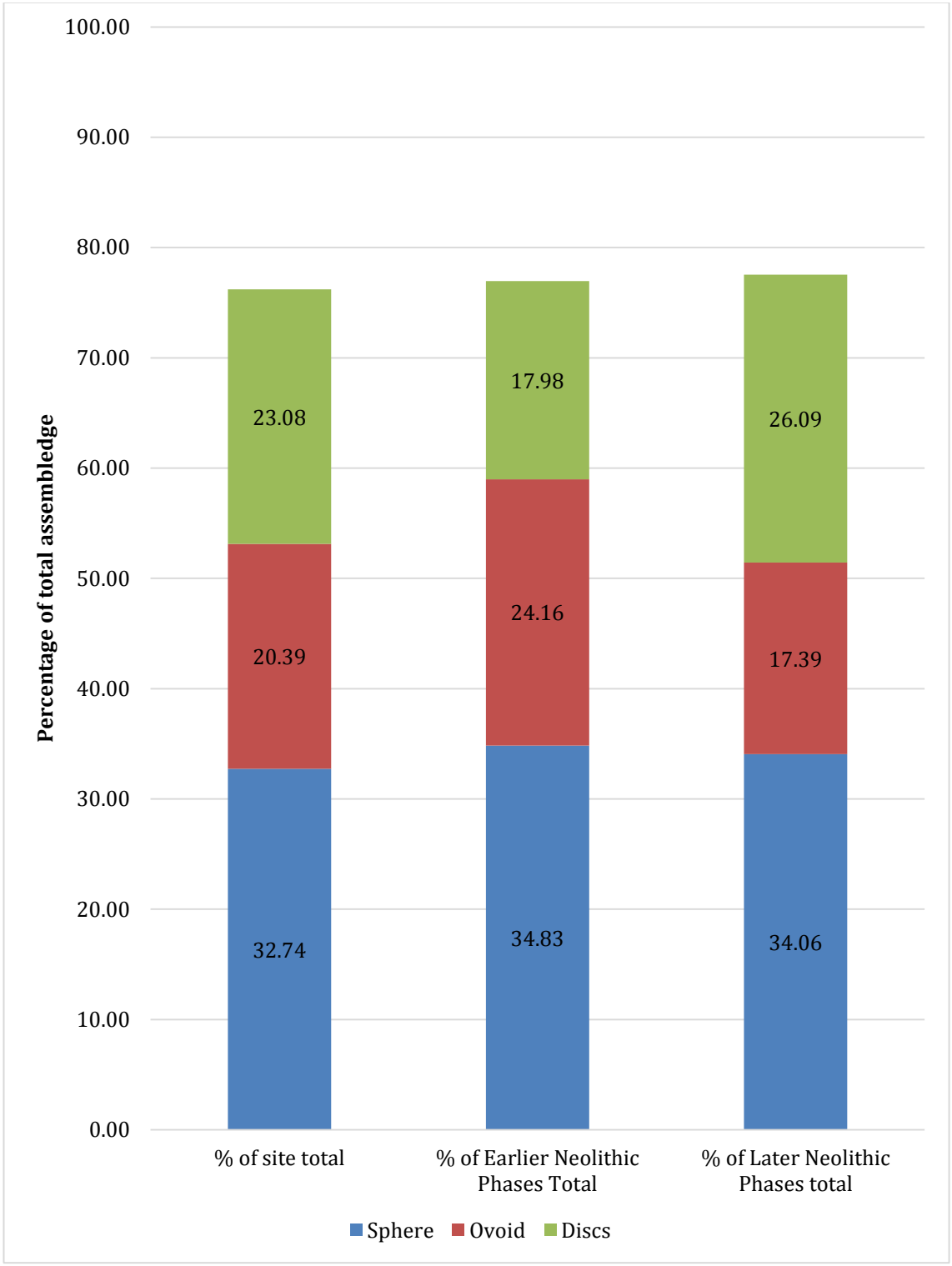


Figure 6.23: Comparision of the three most common, broad three-dimensional shapes; all objects, *earlier* Neolithic and *later* Neolithic phases.

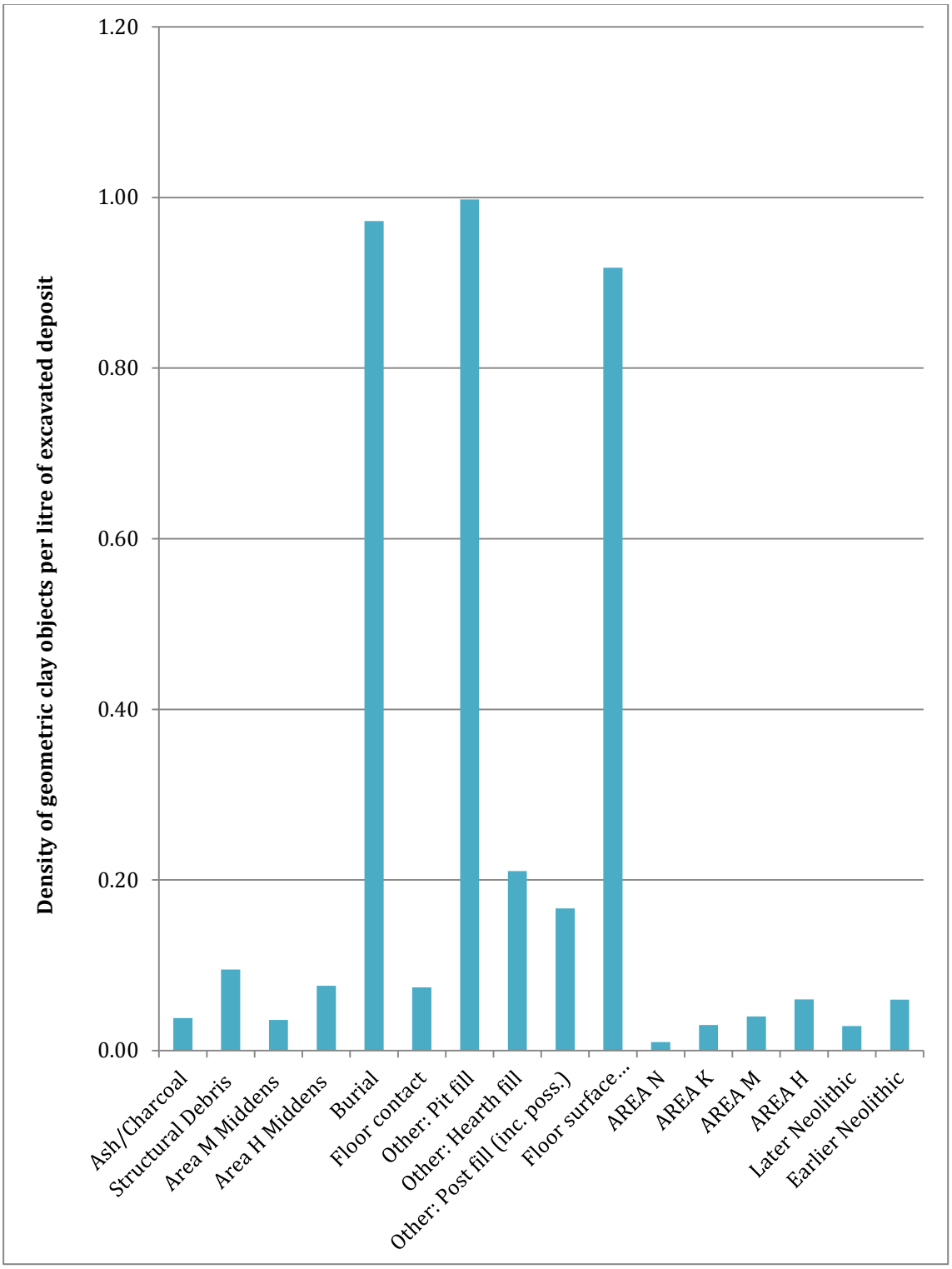


Figure 6.24: Comparison of the density of objects across the three methods of context type analysis: area/trench, type and phase.

TABLES:

THREE-DIMENSIONAL SHAPE	NUMBER OF OBJECTS	PERCENTAGE OF BONCUKLU OBJECTS
Sphere	77	13.77
F. /S. Sphere	106	18.96
Ovoid	48	8.59
F./S. Ovoid	66	11.81
Disc 1	60	10.73
Disc 2	66	11.81
Disc 3	3	0.54
Cube	0	0.00
Cuboid/f. Cube	7	1.25
Cone 1	10	1.79
Cone 2	9	1.61
Cone 3	7	1.25
Cone 4	0	0.00
Cone 5	1	0.18
Cylinder	38	6.80
Other/misc./Unknown	61	10.91
TOTAL	**559**	**100.00**

Table 6.1: Number and percentage of objects of each three-dimensional shape. The objects were recorded against a predetermined set of "types" (shaded together above)and "sub-types".

SEALINGS	NUMBER OF OBJECTS	% OF BONCUKLU OBJECTS
Possible impression	48	8.62
Definite impression	18	3.23
Possible Unidentifiable impression	20	3.59
Definite unidentifiable impression	18	3.23
Other	12	2.15
No impressions	443	79.53

Table 6.2: The number of objects with impressions, and the number identifiable-"possibly", "definitely" or not at all.

DESIGN-EXACT COMBINATION OF MARKINGS	NUMBER OF OBJECTS	% OF MARKED OBJECTS	% OF BONCUKLU OBJECTS
Straight line(s) only	25	29.07	4.47
Parallel lines	14	16.28	2.50
Plant Impression(s), Parallel lines.	12	13.95	2.15
Straight line(s), Plant impressions : Plant Impression(s)	6	6.98	1.07
Round depressions	4	4.65	0.72
Incised circles	4	4.65	0.72
Plant Impression(s)	3	3.49	0.54
Straight line(s), Detailed/intricate/other	2	2.33	0.36
Detailed/intricate/other and Round depressions	2	2.33	0.36
Detailed/intricate/other	1	1.16	0.18
Crossing Lines (squares)	1	1.16	0.18
Straight line(s)0 only	1	1.16	0.18
Crossing Lines (diamonds)	1	1.16	0.18
Straight line(s), parallel lines	1	1.16	0.18
Straight line(s), Plant impressions , Detailed/intricate/other, Crossing Lines (squares)	1	1.16	0.18
Straight line(s), Parallel lines, Crossing Lines (squares), Plant impressions	1	1.16	0.18
Straight line(s), Parallel lines	1	1.16	0.18
Plant impressions, Crossing Lines (squares)	1	1.16	0.18
Parallel lines, Curved line(s)	1	1.16	0.18
Straight line(s), Detailed/intricate/other	1	1.16	0.18
Matting, Plant impressions	1	1.16	0.18
Matting, Parallel lines	1	1.16	0.18

Table 6.3: The design or exact combination of designs found on marked objects- the number and percentage of objects of design.

	CONTEXT TYPE	NUMBER OF CLAY OBJECTS	AS A % Of "DEPOSIT" OR "STRUCTURAL" CONTEXT GOEMETRICS	TOTAL % OF BONCUKLU GEOMETRICS
DEPOSIT	Arbitrary	2	0.48	0.36
	Indeterminate (Deposit)	20	4.80	3.58
	Ash/Charcoal	5	1.20	0.89
	Packing	0	0.00	0.00
	Make-up/Levelling	5	1.20	0.89
	Dump	2	0.48	0.36
	Midden	266	63.79	47.58
	Burial	14	3.36	2.50
	Structural Debris	43	10.31	7.69
	Animal/plant	0	0.00	0.00
	Artefact cluster	0	0.00	0.00
	Floor contact	**2**	0.48	0.36
	Erosional products	0	0.00	0.00
	Partly Natural	1	0.24	0.18
	Wholly Natural	0	0.00	0.00
	n/a (no option selected on form)	9	2.16	1.61
	Other	49	11.75	8.77
STRUCTURAL ELEMENT	Indeterminate (structural element)	1	11.11	0.18
	Floor surface	6	66.67	1.07
	Face	2	22.22	0.36
	Wall	0	0.00	0.00
	Platform/Bench	0	0.00	0.00
	Paving	0	0.00	0.00
	Bin	0	0.00	0.00
	Oven	0	0.00	0.00
	Pillar	0	0.00	0.00
	Other	0	0.00	0.00

Table 6.4: Number and percentage of Boncuklu objects from each possible specific context type.

CONTEXT	OBJECT DENSITY PER LITRE
Area N	0.01
Area K	0.03
Phase: *later* neolithic	0.03
Ash/charcoal	0.04
Area M middens	0.04
Area M	0.04
Area H	0.06
Phase: *earlier* Neolithic	0.06
Floor contact	0.07
Area H middens	0.08
Structural debris	0.10
Post fill	0.17
Post fill	0.17
Hearth fill	0.21
Burial	0.97
Pit fill	1.00

Table 6.5: Density of geometric clay objects (within each litre of excavated deposit) by context type comparing context by area, nature and phase.

CONTEXT CODE	CLAY OBJECT NUMBER	SEALING?	THREE-DIMENSIONAL SHAPE	DIMENSIONS: PLAN VIEW-LENGTH (CM)	MARKINGS PRESENT?	MARKINGS BASIC FORM PRESENCE:
ZHA	831	No	Flattened/semi-ovoid	1.7	No	-
ZHA	21	No	DISC 1 (flat/convex base and top)	1.5	Yes	Type 12: plant impression(s);type 2: straight parallel lines
ZHB	34	No	Shapeless/too frag./other shape (i.e. Sealing)	2.3	No	-
ZHI	1419	Maybe	Shapeless/too frag./other shape (i.e. Sealing)	2.25	No	-
ZHL	872	No	DISC 2 (flat base)	2	Yes	Type 1: straight, independent line(s)
ZKM	748	Maybe	DISC 1 (flat/convex base and top)	1.65	Yes	Type 12: plant impression(s)
ZKM	747	Maybe	Shapeless/too frag./other shape (i.e. Sealing)	1.75	No	-
ZQE	1508	No	Flattened/semi-sphere	1.7	Yes	Type 2: straight parallel lines
ZQH	1545	No	Cylinder	3.1	No	-
ZQH	1530	No	Sphere	2.4	No	-
ZQH	1526	No	Cylinder	2.85	No	-
ZQH	1525	No	Flattened/semi-ovoid	2.75	Yes	Type 2: straight parallel lines
ZQH	1524	No	DISC 2 (flat base)	2.5	No	-
ZQH	1523	No	DISC 1 (flat/convex base and top)	1.7	No	-
ZQK	1542	No	DISC 2 (flat base)	2.1	No	-

Table 6.6: Summary of the characteristics of the objects found in burial contexts.

CHAPTER 7: ÇATALHÖYÜK ANALYSIS

7.1-INTRODUCTION

Due to the duration and scale of excavations, along with a thorough retrieval process (see Chapter 4.2) and finds policy (to store all artefact, possible artefacts and structural materials recovered), many thousands of clay artefacts have been recovered from Çatalhöyük over the many excavation seasons. Aside from the clearly identifiable artefacts including large "clay [cooking] balls", stamp seals and figurines (which overall are well defined, having been consistently catalogued and studied at the site over the many years of excavation), there are many crates of miscellaneous clay objects of unidentified function containing well over one thousand small, intentionally shaped clay objects in addition to non-artefact pieces of clay including remnants of structural material. Smaller numbers of geometric clay objects are found registered by the finds team as "mini balls" and "figurines" for example, highlighting the general problem with the categorisation of artefacts and definitions in archaeology more widely (as discussed in Chapter 5). A total of 676 small clay objects (of various functional and typological designations) are analysed here in detail (for which further illustrations can be found in Appendix C). In addition, 19 small stone spheres (CO#s 2688-2706), >1,000 "mini clay balls" (further to those considered in this chapter) and a number of zoomorphic figurines are discussed in Appendix D.

7.2-THE ASSEMBLAGE: BASIC OBJECT FORM & CHARACTERISTICS

7.2(a) THREE-DIMENSIONAL SHAPE

Çatalhöyük's clay objects were classified by shape in both two and three-dimensions, as identified from a set of predetermined 'types'. Nine broad, three-dimensional shape categories are represented; with further sub-divisions within some of these (see Chapter 5, figure 5.3). Considering the broad categories: spheres (including flattened/semi-spheres) and discs (all sub-types combined) are the two most common shapes, constituting 32.50% (n=220) and 34.86% (n=236) of all recorded objects respectively (table 7.1, figure 7.1 top). Breaking the three-dimensional shape groups down into their sub-categories, discs (specifically the "type 2" discs) form 24.08% of Çatalhöyük's assemblage (n=163), with far fewer of the other types of discs found. Spheres are the next most common at 22.30% (n=151). Spheres are more than twice as common as their flattened/semi-spherical counterparts which number just n=69 (10.19% of all recorded clay objects at Çatalhöyük). Most of the other shapes are represented in smaller numbers of less than 5% of the total, aside from type 1 cones (n=62, 9.16%), type 1 discs

(n=57, 8.42%) and the "other/miscellaneous" category (n=46, 6.79%) (table 7.2 and figure 7.1 bottom). The latter includes well-formed objects which do not fit into any of the conventional shape designations, objects where the original shape is unclear due to breakage and objects which are not three-dimensional in shape – such as possible sealings. Of the Çatalhöyük assemblage, a number of very regular, well-formed and well defined cones and two perfectly shaped cuboids are among the notable shapes (figure 7.1c).

7.2(b) WEIGHT, SIZE & COMPLETENESS

As the selection strategy characterises the assemblage as small and portable, the overwhelming majority of objects weigh less than 10g (89.81%, n=608), 50.07% (n=339) weigh between 0.5g-2.99g, with an overall average object weight of 4.46g. There are, however, a number of very light objects with 35 (5.17%) weighing less than 0.5g and the lightest complete object being a disc weighing only 0.10g (CO# 972). The maximum size of clay objects at Çatalhöyük, as measured from three angles, demonstrates that the majority are very small, with the average length, width and height/thickness all falling between 1.22 cm and 2.06 cm (see Appendix C figure A-C.3). In size range, the clay objects do not fall within any particular grouping, with a graduated increase and decrease in size, peaking within the average ranges above. This suggests that like neighbouring Boncuklu Höyük, there was no standardized size, or set of sizes for objects of any shape at Çatalhöyük. The overwhelming majority, n=432 (63.81%), of the recorded objects were complete and intact. Of the incomplete objects, almost all had limited damage; only 4 (0.59% of all studied Çatalhöyük geometrics) were less than 25% complete.

7.2(c) CRAFT, FABRIC & TECHNOLOGY

Çatalhöyük's clay objects comprise a limited range of colours dominated by "dark grey/black" and "dark brown". Looking only at the basic colour, (excluding the shade), over half of the objects (55.47%, n=375) are described as a shade of "grey", and 41% (n=281) a shade of "brown". Considering the exact shade, the majority of the objects are dark. Over 85% of the assemblage has a colour of "black" (n=122, 18.05%), "dark brown" (n=101, 14.94%), "dark grey" (n=250, 36.98%) or "mid-grey" (n=105, 15.53%). Very light-coloured objects (beiges and creams) are rare, as are those with an orange hue. There is some patterning seen in the range of colours, shades of colour and three-dimensional shape (figure 7.2). The rounded objects (spheres, semi/flattened-spheres,

ovoids and semi/flattened ovoids) are dominated by dark browns and dark greys (figure 7.2). Other shapes, such as the cones, show no patterning in terms of colour.

The assemblage is homogeneous in terms of finish: 97.36% of clay objects can be described as having a 'smooth' or 'very smooth' original outer surface. Almost all have a "fine" clay texture (99.18%, n=605). Despite this however, fingerprints are rarely visible, present on only 8.89% (as seen through a hand lens). Just over half of all objects have visible inclusions (n=383, 56.57%), most of these, 40.65%, contain mineral inclusions only. Just 10.06% of objects contain organic inclusions only (n=68), while 5.92% contain inclusions of both types. Organic inclusions are most commonly unidentified plant remains (n=108 objects). Shell, reeds and carbonised plants are also found in very small quantities. The proportion of visible inclusions declines with the increase in outer surface smoothness. The general lack of diversity in all forms of clay analysis suggests the use of a limited range of (probably) locally sourced clays.

The assemblage is also similar in terms of craft technique; the majority of objects are crafted by the rolling of clay between the palms and fingers (89.35%, n=604). Almost all Çatalhöyük objects (n=520; 85.00%) were judged to have been intentionally hardened in some way (e.g. baking or sun drying), as assessed by the object's hardness, outer surface texture and friability. However, only a small proportion of objects are burnt; 37 objects "definitely" and 26 "possibly" burnt (9.31% in total). This suggests clay objects were intentionally hardened, perhaps being sun dried. Notably, the proportion of "baked" objects varies by three-dimensional shape. 87.64% of cones for example are "baked", and 84.29% of semi or flattened spheres are "baked". Only 50% of clay spheres display any sign of intentional hardening (figure 7.3). Looking more closely at the spherical shaped objects, those classified (by the Çatalhöyük finds team) as "mini" balls (72 are recorded in detail) are far less likely to be baked at 12.50% (n=9).

7.2(d) Impressions, Wear & Decoration

The presence of incidental impressions created during crafts is evident on only 4.73% of Çatalhöyük's clay objects (n=32). Less than half of these can be tentatively identified, with basketry and matting the most common (visible on 6 objects each, with each form constituting 20.69% of objects with impressions). Two possible rope/string impressions have been found as well as two possible leather impressions (figure 7.4). Notably, the objects with impressions are restricted to a limited range of three-dimensional shapes and craft technique. 56.25% are type 2 discs, created by rolling and then sculpting onto a

flat but marked surface. Despite spheres dominating the assemblage as a whole, none of the impressed objects are spheres, suggesting that these impressions were perhaps created unintentionally in the manufacture process. No sealings were definitively identified within the Çatalhöyük material, however, there are 7 *possible* examples. The shape and presence of impressions on some objects suggests they were applied to something, possibly as a sealing, but equally plausibly as part of the manufacture process. 3.7% of Çatalhöyük objects appear to have been applied to a flat surface and 0.74% to a three-dimensional surface while wet. Only one of the possible sealings (CO#942) has a clear impression of basketry or matting. More than half of the possible sealings are miscellaneous in shape and the other three are disc shaped (table 7.3).

Just under one quarter of Çatalhöyük's clay objects (n=159, 23.52%) show signs of heavy wear. Of these, the location of the wear is variable and there is no correlation between the presence of heavy wear and other characteristics including object weight, size or colour. There is correlation, however, between the presence of heavy wear and shape; with certain shapes more likely to evidence heavy wear than others. Only 10.07% of spheres and 19.07% of discs (all three sub-types combined) show wear, for example. In contrast, 41.24% of cones (all sub-types combined) and 40.63% of flattened/semi-ovoids have wear.

7.2(e) MARKINGS

A small but distinctive number of objects have intentional decorative "markings" (n=44, 7.06%). They appear most commonly on only one or two surfaces of the object (top and/or base) and most examples are only partially covered in markings. Almost twice as many have applied markings (i.e. with an instrument such as a stylus) as opposed to the markings being impressed onto the object. One has decorative markings applied by a fingernail (as often seen on other Neolithic clay items such as figurines). Only 12 objects are more than 50% covered in markings, with just four displaying full coverage (figure 7.5). Most of the markings (79.55% of marked objects) are clearly visible against the smooth finish of the objects, with a range of designs evident (table 7.4). Just over half of the marked objects (n=23) have single markings only. The rest (n=21) display groups of markings, yet these sets or groups of markings generally consist of sets of either one or two differing forms (table 7.5, figure 7.6). Certain shapes are more commonly marked than others. Overall, 9.32% of discs have markings. 8.70% of flattened/semi-spheres and the "misc." objects have markings. In contrast, less than 5% of spheres, 5% of ovoids and 1.61% of Type-1 cones display markings (figure 7.7).

Considering specific designs and the repetition of them, the most commonly found design is straight independent lines, found on 18 clay objects (40.91%). Straight parallel lines is the next most common, found on 9 objects (20.45%). Plant impressions, deliberately placed for decoration, are found on 7 15.91% of the marked objects. The plant impressions are interpreted as deliberate on these objects specifically due to the depth and clarity of the impressions. The impressions are so clear, the only explanation can be that the wet clay objects were pressed firmly onto an irregular surface (thus intentionally marking the object), rather than the far shallower impressions left if a wet, fully shaped and finished clay object was then left to dry on an uneven surface. In this second instance, the resulting plant impressions would be far less deep and less visible. The plant impressions on the 7 objects interpreted as deliberately created "markings" are also extensive in their coverage. The entire side of at least one surface of these objects has clear and deep plant impressions rather than only part of one surface. This again suggests deliberate placement. If merely rested on an uneven surface to dry, plant impressions would only be transferred onto those parts of the object that naturally come into contact with the resting surface. Of the objects with deliberate plant impressions classified as "markings" therefore, the entire surface has impressions, even those parts of one side which are concave, and in many case both the top and base surfaces, unnecessary in order to either crate the shape, or if the secondary result of an uneven drying surface. All other motifs and motif combinations are found in much lower numbers (table 7.5).

7.2(f) SUMMARY

The overwhelming majority of recorded clay objects at Çatalhöyük, share characteristics related to manufacture as well as appearance, displaying the same, generally limited range of sizes, weights, geometric shapes, fabric and finish. Spheres and discs (including sub-types) are by far the most common basic three-dimensional shape. This patterning is enhanced when considering the 16 pre-defined detailed shapes. Spheres (excluding flattened and semi-spheres) and type 2 discs combined constitute nearly half of all Çatalhöyük's clay objects (46.45% combined). Within the three-dimensional shape categories, the ratio of length, width and height is more standardized than at neighbouring Boncuklu Höyük, for all shapes (aside from the miscellaneous category), giving the Çatalhöyük clay object assemblage a more uniform appearance within it's shape groupings (see Appendix C figures A.C-9 and A.C-10). Furthermore, most Çatalhöyük clay objects are well formed and crafted from what appears to be a range of

primarily locally sourced clays, mirroring the results of analysis of the clay sources of a selection of figurines and other artefacts at the site (Avis 2010: 102–103).

No correlation between clay type and object form is evidenced, suggesting people utilised the clay abundant within the immediate vicinity, making no selection according to specific visual or technological qualities. Impressions sometimes formed on the surface of clay objects are evidenced as a result of craft and drying, and a far smaller proportion appear to have intentional and extensive plant impressions. Though the majority of clay objects are plain, a small proportion were afforded intentional elaboration in the form of "markings", as common on the much later fourth to first millennium BC examples of "'complex tokens" (i.e. Schmandt-Besserat 1992a: 49-92). The majority were hardened by simple sun drying and preserved complete or largely intact. The simple nature of the objects is not to say care was not taken, almost all have been crafted with care and attention, with a smooth exterior surface finish, rather than a crude, rough, incomplete look. In comparison to the Boncuklu Höyük assemblage, increased standardization is evidenced in the Çatalhöyük assemblage. Though no set size distribution is evidenced within the shape categories (within each shape, the objects are present in a range of sizes, rather than being grouped into set size distributions), spheres are the exception to this rule (see section 7.3a below and Appendix D). In addition to spheres, other small, discrete collections of clay objects, highly uniform in shape, size and other characteristics are found within the larger Çatalhöyük clay object assemblage (section 7.3 below).

7.3-EXTENDED OBJECT FORM: NOTABLE COLLECTIONS

7.3(a) "MINI" BALLS

Of the recorded spherical shaped objects (n=149), 72 of them (including one ovoid) form a distinct and discrete collection of objects, not only in shape, but in all attributes. Classified on site as "'mini balls" (figure 7.8), the recorded and fully studied "mini balls" count of 72, represents just a small proportion of the hundreds of such objects recovered (studied in less in-detail at tier 2 level from the site records only, see Appendix D for full discussion of the extended "mini ball" count). The recorded "mini balls" display a much more restricted range of weights and sizes than the total recorded spherical-shaped object assemblage (figure 7.9). They are well rounded in shape, and far less likely to be fragmented than other objects (over 80% are complete compared to 74.83% of all recorded Çatalhöyük "spheres" and 63.81% of Çatalhöyük objects combined).

The "mini" balls are very uniform in colour, with 69.01% described as "dark grey-dark brown". All "mini balls" are described as having a "fine" surface texture and all have a distinct dusty surface due to the lack of hardening treatment In addition, more than half (54.9%) display organic inclusions, compared to just 10.06% of all Çatalhöyük recorded geometrics combined (figure 7.10). The homogeneity of these objects suggests they may have been crafted simultaneously, if not used together as a group. Recent analysis by Doherty (2011) suggests that although all are seemingly identical in terms of craft and fabric when viewed with a hand lens, under a microscope they are in fact made from a diverse range of local clays. Whether or not Çatalhöyük's "mini balls" are intentionally made is contentious. Doherty feels that although many display signs of moulding (compacted clay, fingerprints), they are naturally formed on the slopes of clay sources and within clay extraction pits (Doherty 2011: 93-95).

7.3(b) SQUAT CYLINDRICAL-SHAPED OBJECTS

Other assemblages which stand out from the bulk of objects are a collection of three squat cylindrical-shaped objects: CO#s 396, 431 and 441 (recorded as "other/miscellaneous" shape) (figure 7.8 and 7.11). They share similarities in the degree of detail, finish, craft and decoration which hints at a defined, uniform function.

7.3(c) IMPRESSIONS & POSSIBLE SEALINGS

Of the items which display unintentional impressions, seven can be singled out due to the overall object shape (appearing to have been deliberately pressed onto or around an object in order to seal its opening and/or contents) and are very tentatively designated as possible sealings, although the object(s) to which they were applied is unclear (figure 7.12 and table 7.6). Most *possible* sealings are also slightly larger than the average Çatalhöyük clay objects. Five of the examples are complete, having been perhaps placed on top of something to seal it. Two of these objects derive from the same unit and all come from middens or mortar contexts in later Neolithic levels.

7.3(d) CONES

Three distinctive sets of cones can be distinguished from within the large number of cones recorded from Çatalhöyük. All recorded cones (from Çatalhöyük and other studied sites) are definitely objects in their own right, not possible figurine fragments (horns, tails etc.) as only those cone-shaped objects with a flat and intact base were recorded (see methodology Chapter 5). The first homogenous set, set "A" comprise 11 objects, all very similar in appearance and craft. They have a distinct round base in plan view, which

is concave (figure 7.13). The sides are long and straight, with a well-defined, pointed tip on all but one example. All are highly crafted from a "fine" clay. Set "B", comprising 6 cones are again all very similar in appearance (figure 7.14). They have a defined, flat base, very smooth outer surface finish and all are made from fine clay. All have a round base, yet three have slightly flared sides. The third group, set "C" all have a round base (in plan view), which is flat. The diameter of the base is similar in dimensions to the lengths of the sides and again, all are highly crafted with a smooth outer finish (figure 7.15).

7.4-CONTEXT

7.4(a) AREA

The recording strategy at Çatalhöyük aimed to study only objects from the Neolithic East mound (see Chapter 4.2), however, a small number of objects from other locations are also included within the studied assemblage (n=9 West mound and n=11 recovered "off-site"). The vast majority of clay objects come from the two largest and most extensively excavated areas of the East Mound (see map-figure 4.2-2 in Chapter 4.2 for locations); 34.96% (n=243) from the South Area and 40.72% (n=283) from the North Area (Area 4040, figure 7.16). A further 7.63% come from TP Area (n=53) and far fewer from Bach and IST (see table 7.7). Looking at the density of objects by area however, the reverse is true with small geometric clay objects more dense in TP and Bach, than in the North and South Areas (figure 7.16).

7.4(b) PHASE OF OCCUPATION

Within both the North and South excavation areas, a range of stratigraphic levels are represented in the recorded geometric object assemblage (phasing data is currently unavailable for IST and Bach Areas and for some units of other areas). Groups broadly into two occupational phases, representing the East mound's "earlier" and "later" Neolithic activity, in general, far greater number of small clay geometrics come from the "later" phases (roughly equivalent to Mellaart's levels II-V) than the "earlier" phases (equivalent to Mellaart levels VI-XII. See Chapter 4.2 & table 4.2-2 for chronology and phasing). A total of 129 clay objects come from the earlier phase of settlement, compared to 389 objects from the later Neolithic. All excavated levels of the TP Area to date fall within the latter Neolithic phase range. When considering objects from only the North and South excavation areas, the proportion of clay objects from the earlier compared to the later occupations remains similar, with one quarter to one third of an area's objects coming from earlier Neolithic levels and two thirds to three quarters of

the objects coming from later Neolithic levels (table 7.8 and figure 7.17). Interestingly, within the detailed phases of the three areas with the greatest number of clay objects (North, South and TP), each has a single phase (within each of the two broad grouping of "earlier" and "later"), which contains a disproportionately higher number of geometrics compared to other phases within that area (clearly visible for North and South Areas in figure 7.18).

Analysis of the density of clay objects through time supports the pattern highlighted above. Both the North and South Areas display clay object densities which indicate they became denser in both areas in the "later" occupation levels. Although proportionally the difference in density between the two broad phases, across both excavation areas is slightly reduced (figure 7.19). Looking at specific phases within excavation areas, many contrasts in both the number and density of clay objects through time can be seen. For example, "South.P." in the broad "later" Neolithic phase has the highest number of objects (from units with an assigned phases) yet in density, is one of the lowest (figures 7.18 and 8.20). In contrast, South.L has the highest density value of any phases, yet only one object. Despite discrepancies in individual phases, the same overall patterning is true when considering either the number or density of objects: there is no gradual increase in the presence of small clay geometrics on-site through time. Clay objects are present in low numbers and proportions within most phases of occupation, with unexplained, irregular peaks in certain phases only.

Despite the provisional density analysis carried out for Çatalhöyük's clay objects, the data used to calculate density has a number of constraints, leading to reservations about the reliability of any resulting patterning. More focused analysis taking into account the different context types and object sub-types in a fashion similar to that undertaken with the figurine assemblage (see Meskell *et al.* 2008: 152-154, tables 3 and 4; Meskell & Nakamura 2013) may be more accurate in assessing variability in the number of clay objects present on site over time and is tentatively undertaken for some specific object types below.

7.4(c) CONTEXT TYPE

A diverse range of context types are represented in Çatalhöyük's clay object assemblage, yet nearly half of the objects (n=282, 41.65%) come from "midden" contexts (e.g. midden layer, midden burnt spot, midden room in-fill; table 7.9 and figure 7.21) and an additional seventeen objects come from a "fill" context (n=140), further described as

"midden fill" (n=17) (table 7.9 and figure 7.21). The overwhelming majority of midden objects come from simple open midden areas, (n=235, 83.33% of midden objects), yet smaller numbers of objects come from "fire spots", "room fill2, "pit fill2 and "burnt layer2 contexts *within* "middens" (table 7.10). Aside from middens, 56 objects (8.27%) come from "construction/make-up/packing layers" including external "building demolition", interior "floor make-up", "room fill", "mortar and mudbrick" contexts (table 7.9, figure 7.21).

In addition to middens, 140 objects (20.68% of all recorded) are categorised as coming from other "fill" deposits (figures 7.21 and 8.22). Far less objects (n=9, 1.33%) come from context types described as "clusters" (figure 7.21 and table 7.11). These dense clusters of occupational deposits primarily consist of concentrated groupings of animal bones (i.e. unit 17070, CO#s 1066, 1067). Yet some contain other additional intriguing elements such as "mini clay ball" clusters (i.e. CO# 1332 in unit 1082) and a cluster of stones inside a building (CO# 906, Unit 17527, Space 202, Building 42). Also in Building 42are three additional clay objects found in direct association with a whole ceramic pot set into the floor; next to an oven and a platform (CO#s 1314, 1315, 1317, Unit 5417, Space 202, Building 42) (table 7.11).

The nature of the clay objects within select context types was studied in order to assess whether the type of objects varied across different contexts, suggesting different functions and uses of objects of different varieties. Objects from select burnt ("burnt midden", "burnt ash deposit", "burnt lime deposit") and unburnt contexts ("middens", "lime deposit") were compared. Interestingly, none of the burnt deposits contained burnt objects, suggesting the burnt objects were burnt pre-deposition or discard. No other distinctive patterning or preference for certain context types according to any specific object characteristic was evidenced. Despite an intriguing range of fill deposit types, hardly any clay objects were recovered *in situ* (see below) and there is no evidence to suggest the objects found in "burial fill", "skeleton deposits", "pit fill" or "wall foundations" were placed there deliberately. Therefore, the vast majority of clay objects from such context types are present accidentally, incidentally included within the fill, as refuse and part of the general make, along with other common materials such as animal bone and obsidian. However, the "cluster" objects suggest interesting activity associations (table 7.11)

7.4(d) ROOM & BUILDING CONTEXTS

Twenty-two of the recorded objects come from the fill (or in-fill) of buildings; three notable and well-documented contexts are illustrated below. CO#s 333, 483 and 499 were all recovered from within buildings; two from the same building and the third from a different, broadly contemporary structure (all later Neolithic levels, see table 7.12). CO# 333 was located in the north area of Building (henceforth "B.") 63, within a heavily burnt storage area which contained many burnt mud pieces and an *in situ* celt. CO# 483 was found within a burial cut under platform Feature (henceforth "F.") 1320 in B.44. The burial contained articulated and disarticulated human remains, scattered in the south and east of the cut. *In situ* finds included an obsidian blade, an arrow head and two beads. CO# 499 was found within the same building in the fill of space (henceforth "Sp.") 120, the main internal area of the building. It was located on an activity surface in the earliest phase of the building's use.

The sediment of Sp.120 is characterised as containing many elements including obsidian, bone, pottery, human bone, numerous clay balls, stone (some worked), charcoal and burnt mudbrick fragments. In addition, *in situ* finds include a clay stamp, an obsidian blade and a bone point. There is nothing particularly distinctive regarding the objects from these building deposits. All are of average weight and length and none have impressions or markings. Their presence in clear activity areas (CO#s 333 and 499) and in association with other artefacts and storage containers suggests these objects had a role in daily household activities; the presence of clay balls in Sp.120 suggests that CO# 499 may have been used in conjunction with other small geometric-shaped clay objects. The fact that a geometric object is also located within a burial fill could be used to imply the symbolic importance of the object. Whilst this is not strong evidence a small number have been found in burial contexts. Additionally, burials at Çatalhöyük rarely contain grave goods and burial fill generally contains everyday refuse items (such as discarded household waste).

7.4(e) *IN SITU* GEOMETRIC CLAY OBJECTS

Three *in situ* clay objects are found within the Çatalhöyük clay objects assemblage; CO#s 410, 444 and 467 (see Appendix A). The three objects are fairly representative of the assemblage as a whole. Two (CO#s 410 and 467) are type 2 discs and CO# 444 is semi-ovoid in shape. All three are well made and at least 75% intact. CO# 444 is covered in a dark grey/black silty material as if burnt. CO# 467 is also black/dark brown in colour, whilst the second disc is coloured orange-brown. All three are baked or intentionally

hardened. Both CO# 444 and 467 have limited plant impressions on their base surfaces. These three objects were all recovered from *in situ* depositions, CO# 410 from the animal bone/feasting deposit cluster ((11392), Sp.261); CO# 444, located in the fill of a room (within unit 12465, Sp.295); and CO# 467, a building midden fill (unit 13522) (table 7.13). In conjunction with CO# 410, a large number of finds and objects were recovered *in situ* from the so-called "feasting deposit cluster" (unit 11392). This unit is a distinct midden area containing a diverse collection of faunal remains, personal and utilitarian artefacts as well as weapons. The actual function of CO# 410 within this deposit is unclear, although it is significant that a number of additional small, spherical-shaped clay objects were recovered from this unit, which may have operated in conjunction with CO# 410. CO# 444 was recovered in a context with clear associations to other objects. Similar to CO# 410, it was found immediately next to a large clay ball and a bone awl. The building midden fill (unit 13522) containing CO# 467 records a total of 26 of *in situ* finds. Unfortunately, the geometric clay object has no recorded coordinates to assess objects associations. Objects within the unit, include worked stone and groundstone, various tools, two beads and a pendant and notably; two stamp seals.

7.4(f) SUMMARY OF SPATIAL ANALYSIS

Although only three examples, Çatalhöyük's *in situ* geometric clay objects all demonstrate that rather than being recovered in isolation, they were used or disposed of as a group with other artefacts, ranging in function, both utilitarian and personal. They are found with items such as pigment stones, beads, pendants, stamp seals and also with large "clay [cooking] balls", which are frequently found within houses at Çatalhöyük. The same is true of the *cluster* objects, being found primarily with animal bone refuse and large "clay [cooking] balls". Yet, the association between the *in situ* and *cluster* clay objects and other items in the same location is not interpreted as deliberate in all instances. Rather the location of clay objects along with other, diverse finds appears to represent the loss or discard of general household materials, of which geometric clay objects appear to have been a part, having been used and then misplaced or abandoned within the domestic space. This is supported by analysis of the nature of clay objects recovered from different context types, which does not appear to change, however, this is considered more closely in the following section.

7.5-CONTEXT OF CASE-STUDY OBJECTS

Of the more homogeneous collections of objects, as described above, (and those with distinctive features such as impressions, markings and possible sealings), the degree of

similarity in form could indicate their functioning together as a group, perhaps even being crafted at the same time. Upon examining the context and nature of the find spot of these objects however, this notion cannot be supported by contextual evidence at present.

7.5(a) POTENTIAL SEALINGS

Five of Çatalhöyük's seven *possible* sealings come from the North Area. One was found in the South Area and the last in TP. The possible sealings come from divergent and non-distinctive deposit types, five of which are related to middens. CO# 481 for example, comes from a mortar layer between mudbricks within B.68 (unit 14096). Three examples were found in a layer of midden, two within the same unit (CO#s 400, 474: unit 13139. CO# 1351 unit 14183), yet not in association with one another A further possible sealing was recovered from a burnt layer (CO# 942 unit 13141) and two came from pit fill, interpreted therefore as unintentional secondary deposits (CO# 411 unit 11010, CO# 2233 unit 15899) (table 7.14). None of the possible sealings were therefore recovered *in situ*, accordingly no objects were found in association to confirm or reject their function. However, 10 beads were found in unit 13139 (along with CO# 400 & 474), though direct association is not evidenced. Considering phasing, four of the North objects come from the same phase: *4040.H.* (see Çatalhöyük introduction Chapter 4.2, especially tables 4.2-, 4.2-2 & 4.2-3) and in terms of the broad phasing, notably five of the possible sealings come from the later Neolithic levels, and appear to be roughly contemporary. This suggests their function may be related to changes in social and economic spheres such as increased storage capacity and the appearance of larger, more differentiated buildings (Czeszewska 2014).

7.5(b) MARKED OBJECTS

The presence of distinctive markings on clay objects has been used to support the notion of them functioning as symbolic recording devices; therefore, it would be expected that at least some of these would be found in contexts indicative of this significant role. The contextual evidence, however, does not support this. Just under half of the 44 marked objects come from midden contexts (n=20, 45.45%), 13 of these are midden layers, two are room fill and a further two are pit fill within middens. Far smaller numbers come from fill and unstratified/arbitrary layers, construction/make up deposits – with one from an activity layer and one from a floor context (figure 7.23). All of the marked objects appear to have been recovered in secondary deposits, even the context of the "floor use" object is described as *"make up and likely trampled surface within space 314,*

probably the primary surface within this area, as it seals walls F. 2609 and F. 2610". None of the marked objects were recovered *in situ* though three were found in the same space; Sp. 279, an external midden deposit (CO#s 344, 345, 346).

Looking at the wider context, the marked objects do not come from any particular area of the site, being distributed in the same proportions as other small geometrics. They appear in both the early and late phases of occupation, although 16 of the 18 North Area objects come from a single phase (*4040.I.*; the earlier occupation phase equivalent to Mellaart pre level VI) yet in the South Area, more than double the amount of objects come from the latter (post Mellaart level VI) phases than the earlier phases. Despite the lack of *in situ* objects providing direct evidence related to their function, the presence of marked objects in secondary deposits and middens, however, does not rule out the claim they served a recording function before being disposed of.

7.5(c) DECORATED SLAB

CO#477 is a particularly distinctive object, not only in terms of its larger size and weight (28.5g), but also its skill of craft, shape and decoration (figure 7.24). Only an estimated quarter or half of the original object is present, with the fragment measuring 34 mm x 26 mm x 31 mm. It has been formed of grey-shaded clay, into a cube or cuboid shape. The top surface has four straight, parallel, incised lines spaced at approximately 6 mm apart and 14-18 mm in length. Inside these rows of lines are many small, incised holes which are marked deep into the clay. These holes continue onto the top part of one side only. All these characteristics combine to make CO# 477 very distinctive and suggests a special function. Its larger size, the attention to detail and intricate design suggests its use as perhaps a recording or mathematical device such as those known from the Upper Palaeolithic onwards from both Africa and Europe (Marshack 1991). The object has no comparison from Çatalhöyük at present, yet it bears similarities to the incised stone plaques seen at a number of Neolithic Anatolian sites such as neighbouring Boncuklu Höyük. Unfortunately, the context is less telling, being recovered from an external dump/midden in the South Area of the site (unit 19303). The midden contained a moderate proportion of animal bones, occasional shell and obsidian, and a large clay [cooking] ball. A clay figurine and a bead also came from this unit, again linking this artefact with other highly crafted and valued artefacts.

7.5(d) SQUAT CYLINDRICAL-SHAPED OBJECTS

Despite a uniform appearance that suggests they were created and used together, each of the three squat, cylindrical-shaped objects (CO# 396, 431 and 441, figures 7.8 and 7.11) derive from divergent context types. The two with assigned levels come from the broad later Neolithic phase (table 7.15). CO#396 was recovered from room fill in a storage area containing four bins. No material was found on the surfaces of the bins. *In situ* finds included worked stone, an arrow head and worked bone. This deposit is intriguing, as it mirrors that of CO#333, a semi-ovoid shaped object (covered in finger prints) found in the burnt storage area of B.63; it supports the functional interpretation of these objects as being used in the recording of stored goods. Squat cylinder CO#431 was located in an unstratified and arbitrary unit next to a human bone. The bone (and the geometric object) appears to have fallen from the north-facing section of Mellaart's "Shrine 25". As such, its original context is unclear. Lastly, CO#441 was retrieved from unit 12988-an external midden which is described below.

7.5(e) CONE SELECTIONS

The first set of cones (set "A", figure 7.13) all come from different context types compared to the overall patterning seen in the clay object assemblage at Çatalhöyük, and appear, therefore, to have been subject to special treatment at deposition. Only two are from middens (pit fill in South Area phase *South.P.*). Five come from buildings, three (CO#s 1273, 1275, 1267) from the same building, 77 in Area North. Two of the three Building 77 objects were found in the fill of a bin and the object from Building 3 (CO# 1342) was found in a wall niche. These locations strongly suggests the cones were deposited intentionally inside buildings and in special locations inside them.

7.5(f) "MINI" BALLS (TIER 1 STUDIED)

All 72 of the distinctive mini balls were recovered from contexts containing a number of such objects. Seven of those came from a single unit which also contained two objects logged as 'cones'. The same is true of the 53 recorded objects which came from unit 12988. The large number of these objects found together is distinctive and is reflected in the contexts of the many other recovered mini balls. As many as 727 such objects were recovered *in situ* in one deposit – F.758, B.3 (Atalay 2013, Atalay 2012: 14, Atalay 2001) and in many other examples (see for example Atalay 2009: table 22). Unit 12988 is an external midden layer in Space 279 of the North Area. It is situated in Hodder phase *4040.H.*: the time of distinct changes at the site. The mini balls were not recovered *in situ* and it is therefore unclear if these were deposited together as a group, as in F.758.

Despite containing such a large number of identical, spherical-shaped clay objects, the midden contains no other remarkable characteristics. One of the squat cylindrical-shaped objects (CO# 441), however, was also retrieved from this deposit. The presence of such a large number of clay objects within a single deposit suggests they were used as a group before being deposited together at the end of their life. This deposit, however, is large (3,130 litres), meaning the overall density of the recorded mini balls within this unit is low (0.02 per litre). The high number disposed of over a seemingly short period of time (as seen above) suggests a short life span and frequent disposal, thus supporting the notion that the objects were easily and often made. The additional squat-shaped object, however, is distinctive and highly crafted; its rarity as a shape in the overall recorded assemblage and in contrast to the dominance of spheres, suggests that while spheres may have been easily made and discarded, the same is not true of CO# 441 and other geometric clay objects.

7.5(g) CASE STUDY OBJECTS: CONTEXTUAL ANALYSIS SUMMARY

The morphological data demonstrates that within specific shapes, groups of objects display remarkably similar characteristics across a wide range of variables, suggesting objects identical in appearance were produced simultaneously and functioned together as a group. This idea, however, is not supported by the contextual evidence. Çatalhöyük's clay objects come from a diverse range of context types, rather than being limited to purely refuse contexts or "middens". Indeed, within a single broad context type such as "room fill", the detail of the context of each individual clay object shows additional variability. Aside from "mini balls", which are generally recovered in caches of alike objects, and in large numbers within a single unit (as reflected in the recorded sample, as well as evidenced in other "mini ball" assemblages recovered-discussed in detail in Appendix D) little correlation can be seen when considering object form and context type, with comparable objects hailing from diverse context types and a range of objects forms being present within specific context types.

Çatalhöyük's clay objects are often found in contexts containing not only refuse waste and general household material (such as bone fragments, obsidian fragments and pot sherds) but in many cases, highly crafted and valued artefacts such as beads, bone and stone tools and often one or a number of clay balls. This supports the notion that although the geometric clay objects were easily crafted and obtained, they functioned, were stored and then discarded in the same areas of other, more highly crafted artefacts, as well as more utilitarian domestic objects and materials. The presence of two

geometric clay objects recovered from storage areas (CO#333, from Sp.283 (unit 13950) and CO#396 from Sp.298 (unit 13356)) and a third from a clear household activity space (CO# 499, Sp.120 (unit 11652)) shows these objects were, at least in some cases, utilised in daily household activities and found in direct association with stored commodities.

7.6-SUMMARY & DISCUSSION

Çatalhöyük's clay objects, rather than forming one clearly identifiable artefact category- "tokens", more likely resemble a fraction of a number of divergent artefact assemblages, united by similar manufacture and visual characteristics yet comprised of multiple assemblages of clearly distinct types. A broad range of three-dimensional shapes are represented within the assemblage, yet spheres and type 2 (flat base) discs are by far the most common. Shape definition and object size standardization within shape categories is more apparent than at Boncuklu Höyük, yet within each shape category, a range of objects of distinct appearance are still evidenced, with discrete, highly uniform sets of objects within certain shape groupings (the "mini" balls and cone sets for example). Therefore, overall, the Çatalhöyük clay object assemblage is highly variable in many aspects, yet markedly more standardized than at Boncuklu Höyük where discrete sets of analogous objects within shape groupings are absent.

Like neighbouring Boncuklu, clay objects at Çatalhöyük also appear to be tied to domestic use, evidenced by their context within both houses and middens (representing the refuge from domestic spaces, and other household-based activities). The few *in situ* clusters of artefacts including clay objects all come from domestic spaces, supporting this notion. Overall, midden layers are the most common context type for the clay objects of Çatalhöyük (Data Category), yet significant proportions (in comparison to all other Data Category context types) also hail from floors (use), fill, and room fill (figure 7.21). The peculiar "mini" clay balls are not only distinctive in their uniform appearance but also in their context. All studied examples come from caches from within the domestic space of buildings (see Appendix D for detailed description and discussion). The large number of clay objects recovered from Çatalhöyük suggests the majority of households may have utilised them. As the objects are crafted from clay (an abundant, locally sourced, ubiquitous raw material) and were easily sculpted, the intrinsic value was not within the objects themselves but in the meaning imbued to them upon production and use. This factor, alongside their presence in huge quantities at Çatalhöyük and other settlements (see Chapters 6, 8, 9 and Appendix J), suggests the objects may have had a short life span, being crafted when required and readily disposed

of shortly after use rather than being archived and re-used over a period of time. This is supported by the relatively low proportion of objects displaying signs of heavy wear; while a small number are heavily worn, they retain a well-formed, distinct shape.

Considering the possible interpretations posed at the start of the chapter (e.g. recording devices, gaming pieces or toys), the evidence so far neither offers definitive support for, nor excludes, any of these possibilities. The gaming piece interpretation however does seem less likely here. Çatalhöyük has a remarkable level of preservation (including wooden artefacts, textiles, many layers of plastered floors and walls complete with incised decoration and tiling, and plastered wall and floor installations preserved in their complete form -see Chapter 4.2 and figures 3.13a, 3.19, 4.2-9, 4.2-12, 4.2-13, 4.2-24 and 4.2-25). The sites also has an extremely thorough process of archaeological recording and retrieval (see Chapter 4.2). Over the many decades of excavation, no evidence even hinting at the presence of gaming boards (portable or etched onto floors) has been recovered. In this context, it seems unlikely gaming boards were ever used by Çatalhöyük's inhabitants. This makes the gaming piece interpretation less plausible. Although clay objects may have been employed in gaming without the use of boards, historical, ethnographical and archaeological comparisons support the notion of the combined use of gaming pieces and boards (see Chapter 2.3).

Çatalhöyük is a large site with a large population size, complex economy, and a diverse range of finished goods, raw materials, as well as processed and non-processed foodstuffs in circulation. This, in combination with the extensive evidence of storage, on-site food processing, and artefact production (see Chapter 4.2), all combine to present an image of a settlement where a system to aid in the counting and recording of goods and products in circulation (acquired, stored and exchanged) would be advantageous. The clay objects could have been utilised to aid in administration at Çatalhöyük in a multitude of ways, and it seems likely that a number of methods were used at any one phase of settlement:

1. Within different spheres of location: internally within a single household, across households, between the fields and the village, within the fields alone, inter-settlement.
2. Agent (individual, household, multiple households, small group, larger group).
3. Goods/material: perhaps different systems of administration were employed across different types of goods and materials, divided by stage of processing- raw material/unprocessed foodstuffs vs. finished goods/processed plant and

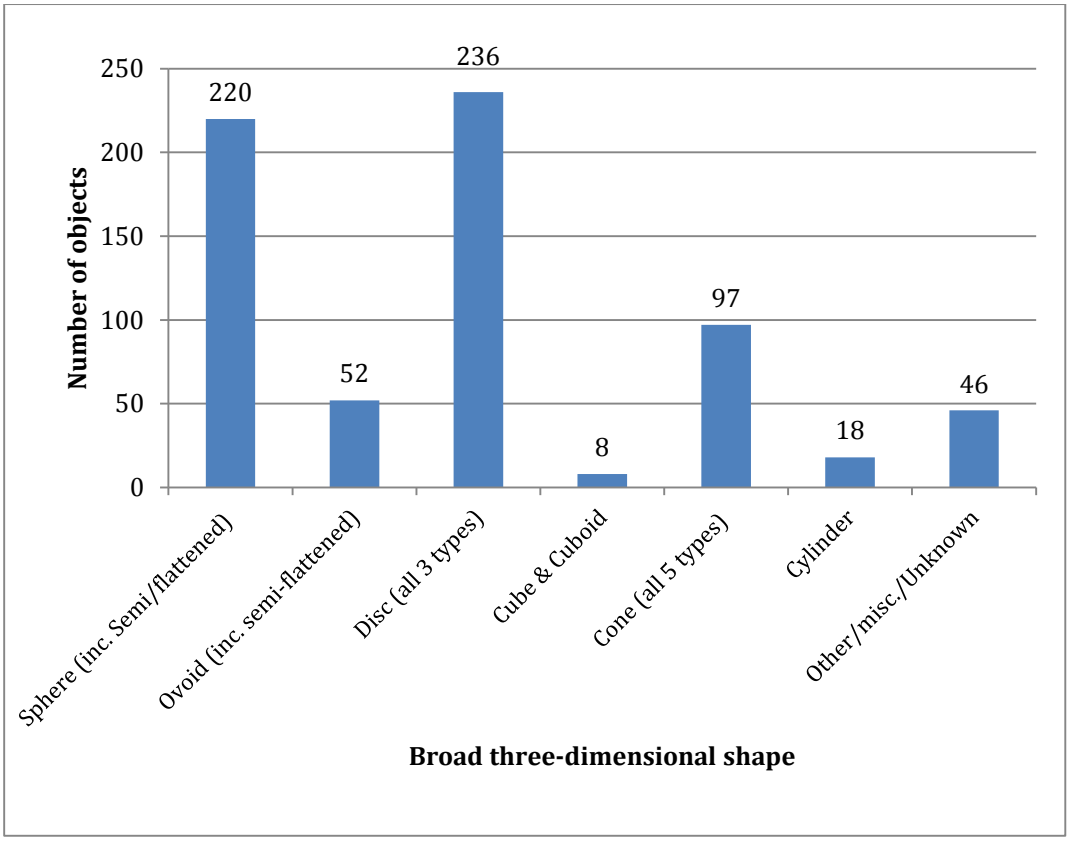
animal food stuffs, source: local vs. imported, or simply by type of material or good: type of stone, type of plant, type of wood, meat, seed species, fruit and vegetable type for example.

However, clear contextual evidence pointing to the use of clay objects in administration is rare (see Neolithic administration context definition in Chapter 5.6a). The majority of Çatalhöyük's studied clay objects were not recovered *in situ*. Furthermore, those recovered from caches tend to have been placed with a number of diverse items rather than purely other clay objects hinting at a ritual rather than administrative function. However the caches of the so-called "mini" clay balls (also see Appendix D), represented by the grouping of identical objects together does suggest the administrative function, and could explain their presence in such locations and large numbers (tables A.D-1 and A.D-2). Yet it is their distinct immediate context (mainly found *in situ,* in caches), wider contexts (within buildings, in pits underneath their floors) and artefact associations (found most often within large numbers of other alike objects, and no other types of cultural material) that indicate the function of Çatalhöyük's "mini" balls was distinctive and different to that of other geometric clay objects at the site.

Analysis of Çatalhöyük's small geometric clay objects highlights the complex nature of artefacts found and activities undertaken at the site. It seems inappropriate to attempt to assign the entire assemblage to a single functional category. The plain, schematic, and varied nature of much of the assemblage would suggest the objects did not have a single function at Çatalhöyük, but rather were multifunctional. The same or similar set of clay objects may have been utilised by different people or groups of people in different ways. Likewise a single person or household may have used their "set" of clay objects in one method of accounting when in the fields collecting fruit for example, an another method of accounting when exchanging their fruit for meat with a neighbouring household, and yet another accounting method when exchange their agricultural produce with the resident of an external settlement for stone. They might have also used the same set of objects for some kind of ritual or divination activity within the domestic space. Certainly the associated items found with the three *in situ* clay objects at Çatalhöyük suggest a ritual function. Society within the Neolithic Near East, and specifically at Neolithic Çatalhöyük was complex and multi-faceted. A simple, overarching interpretative function does not see appropriate for the use of clay objects here.

ILLUSTRATIONS

FIGURES:



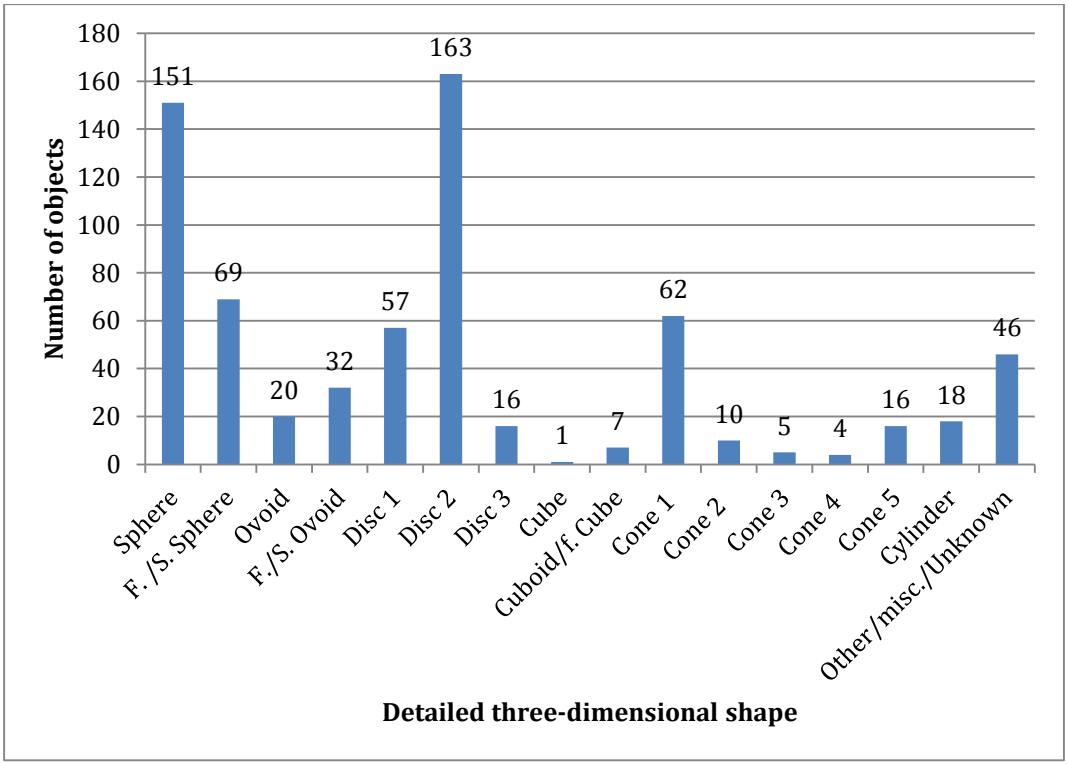


Figure 7.1: Range and proportions of three-dimensional shapes evidenced within the Çatalhöyük assemblage: **(top)** broad categories, **(bottom)** detailed categories.

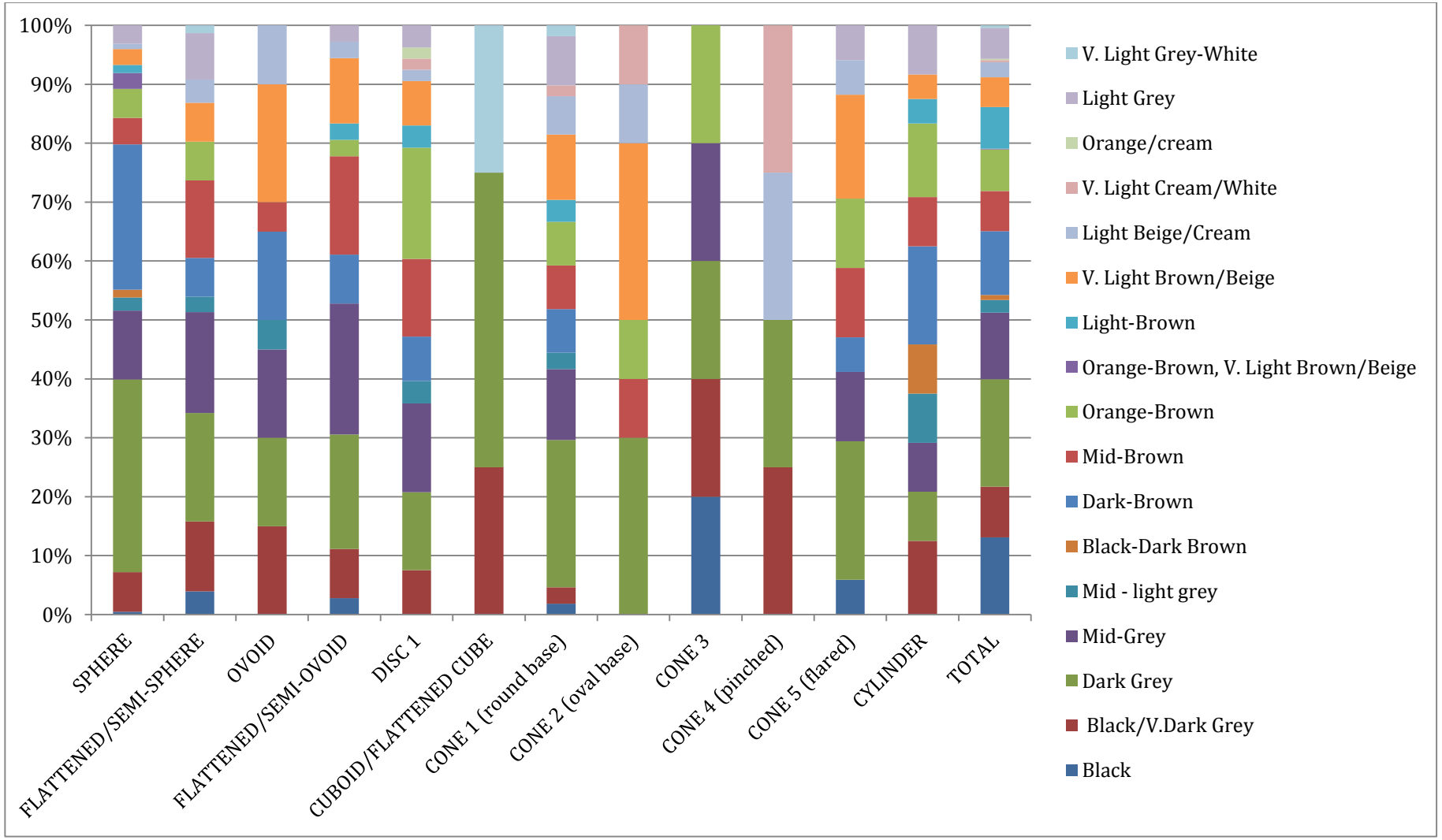


Figure 7.2: Range of colours and colour combinations evidenced in the assemblage, and the number of objects of each colour description according to three-dimensional shape.

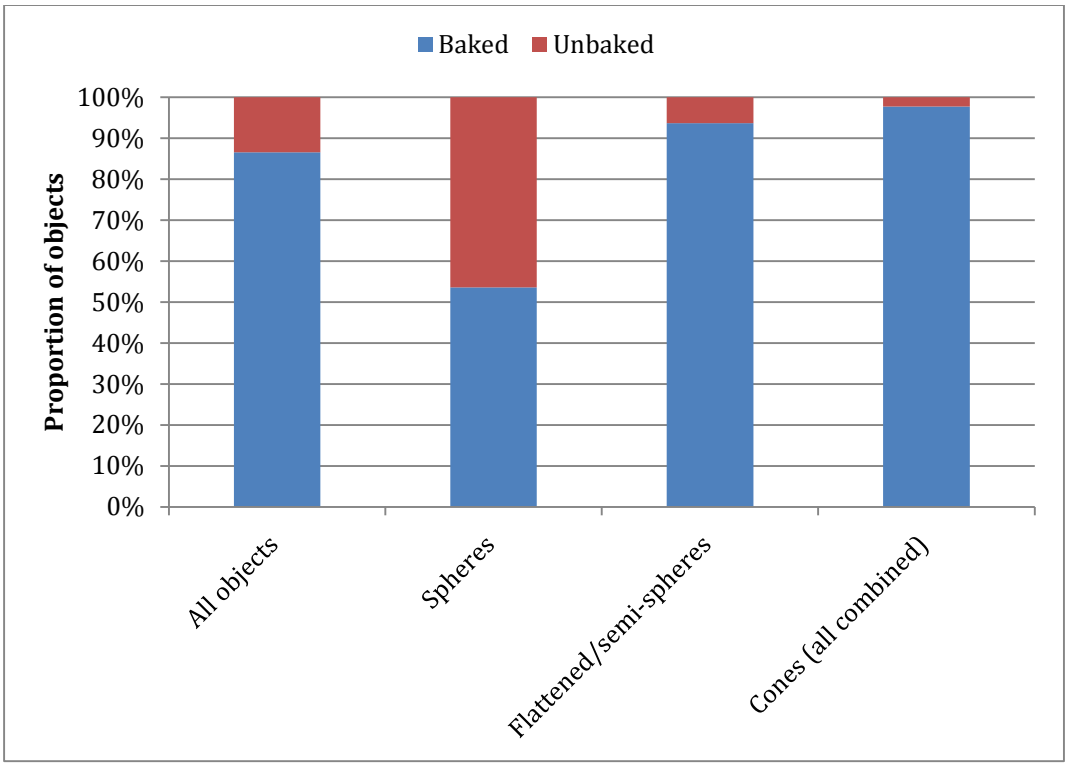


Figure 7.3: Comparison of the proportion of objects (all combined and select three-dimensional shapes) that display signs of intentional hardening or "baking" or not.

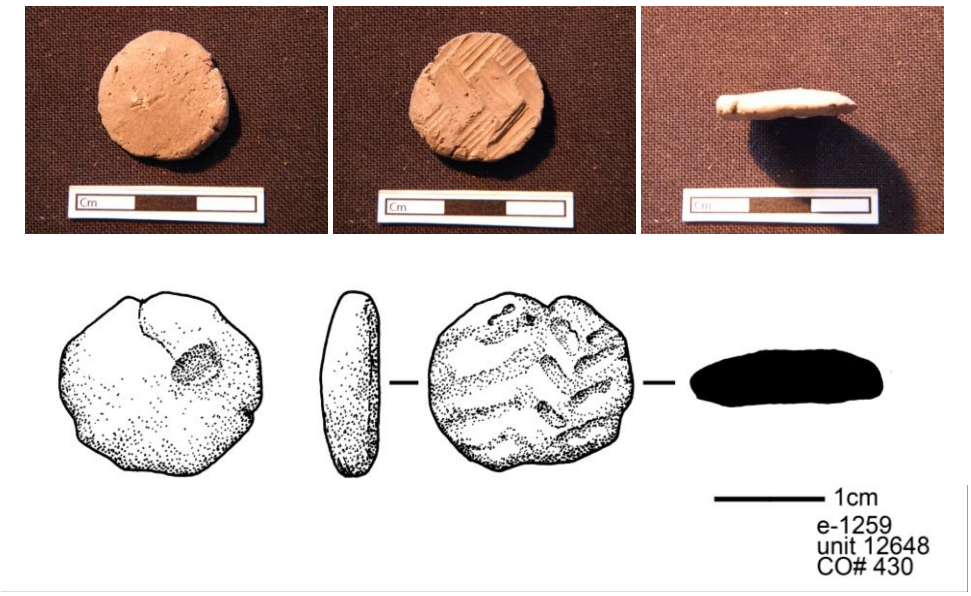


Figure 7.4: Objects displaying impressions on the base surface. Photograph: CO# 942 (author's own). Drawing: CO# 430 (Mesa Schumacher, courtesy of the Çatalhöyük Project).

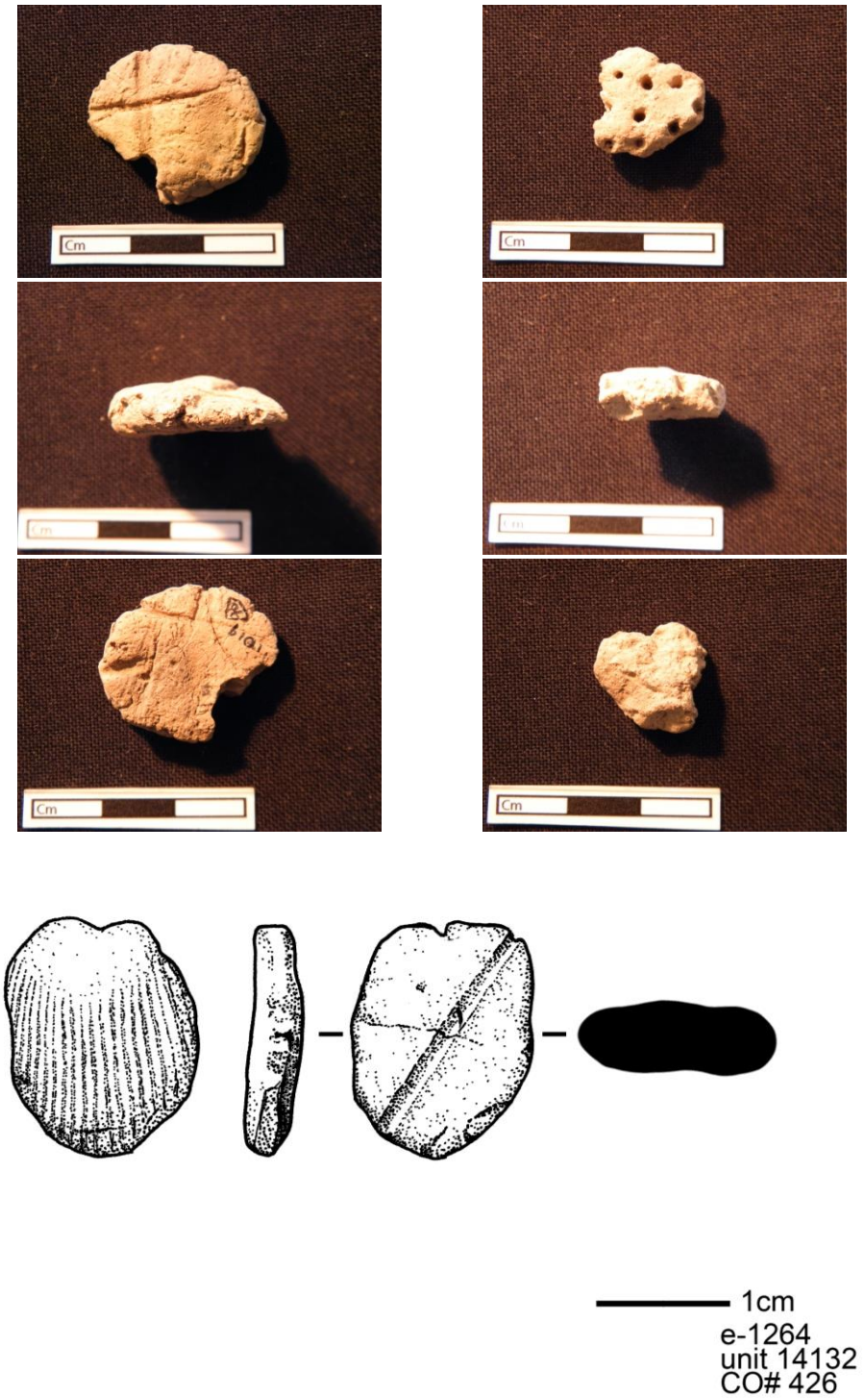


Figure 7.5: Photographs of **(left column)** CO# 432 and **(right column)** and CO# 412, both displaying clear, seemingly intentional markings/decoration. CO# 426 **(drawing)** has a marking an impression. (Photographs: author's own. Drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

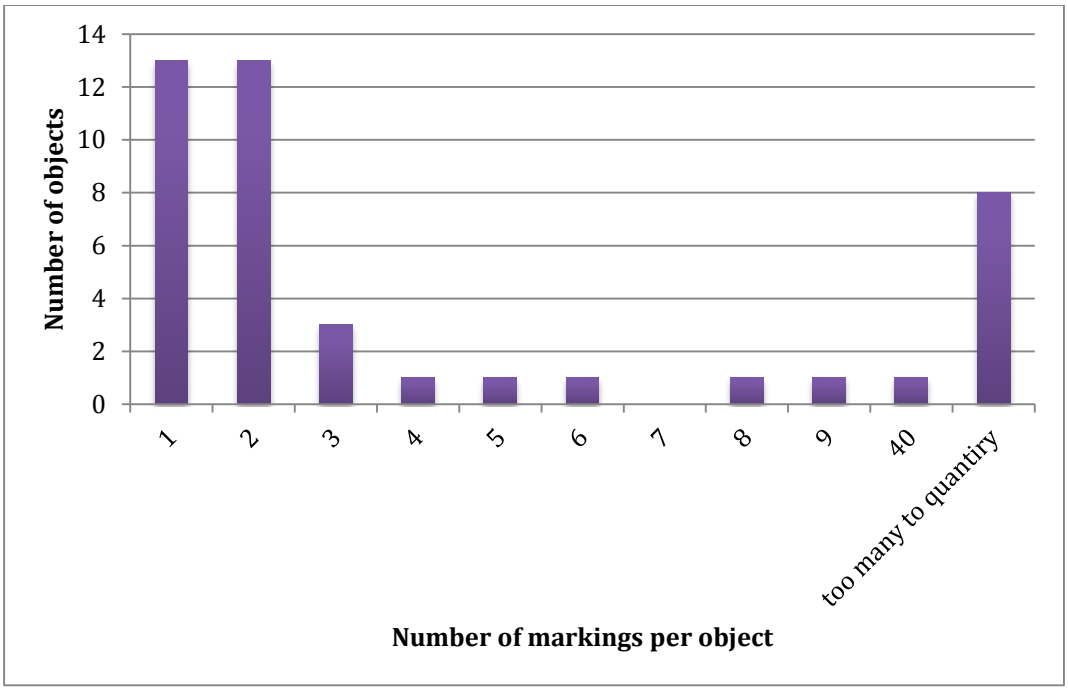


Figure 7.6: Number of markings per marked object.

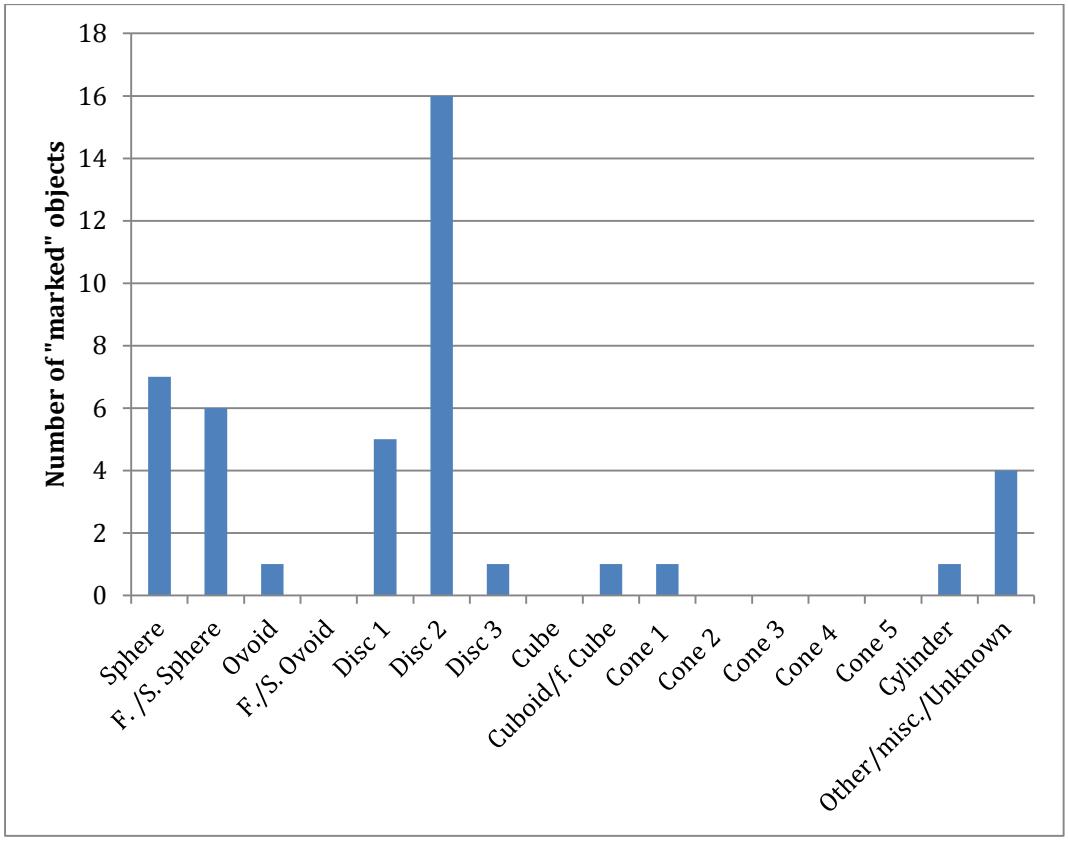


Figure 7.7: Number of marked objects within each three-dimensional shape category.

Figure 7.8: Distinctive objects. **(Left)** selection of the "mini clay balls" (CO# 362-295) from Unit 12988. **(Right)** the three "squat cylindrical-shaped" objects, recorded as "other/miscellaneous" in shape (left to right: CO#s 396, 441 and 431. See figure 7.11 for drawings). (Photographs: author's own).

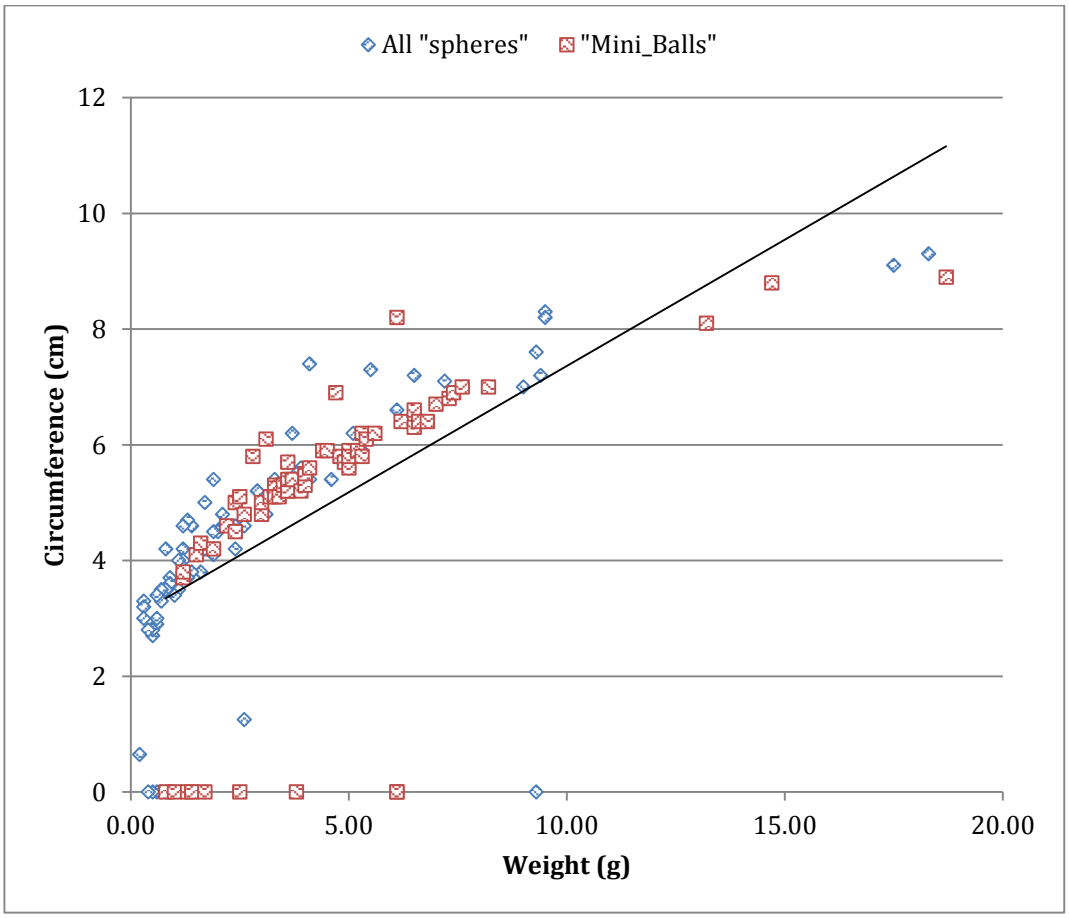


Figure 7.9: Shape consistency: circumference and weight of all recorded spheres (n=149) compared to only the more homogenous group of "mini clay balls" (n=72).

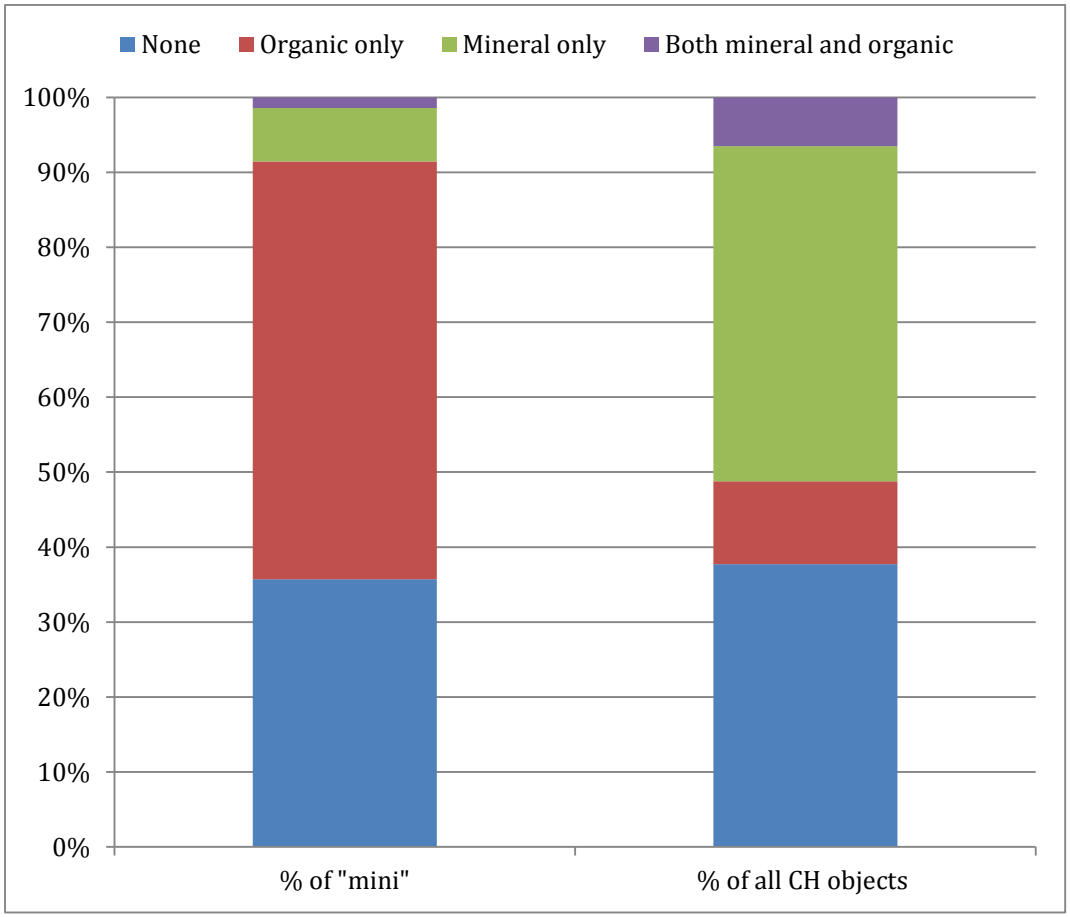


Figure 7.10: Composition of clay. Presence of inclusions in the "mini" ball classified objects compared to all recorded Çatalhöyük objects combined.

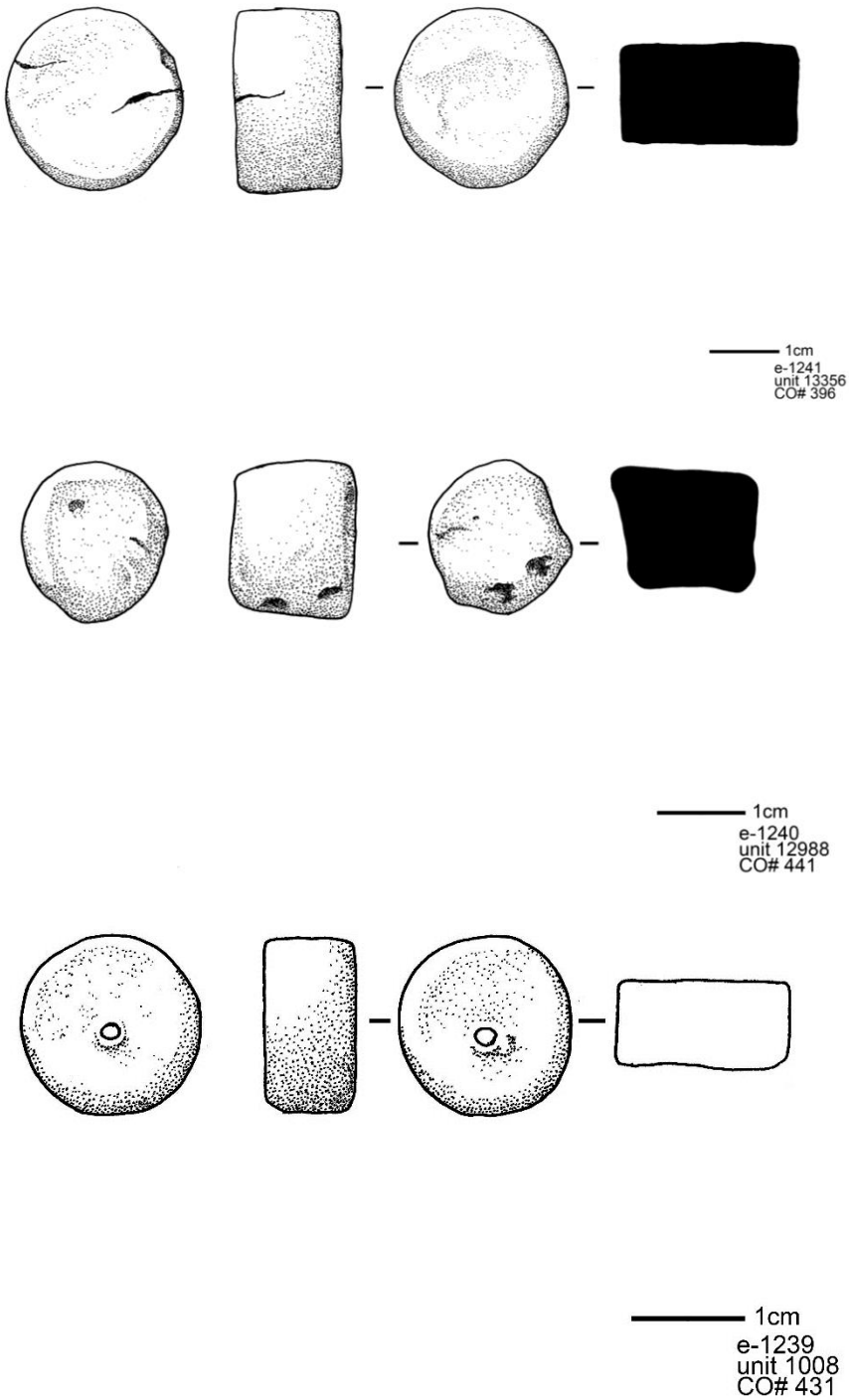


Figure 7.11: Drawing of the three squat cylindrical-shaped objects: **(top)** CO# 396, **(middle)** CO# 441 and **(bottom)** CO# 431). (Drawings: Mesa Schumacher, courtesy of the Çatalhöyük Project).

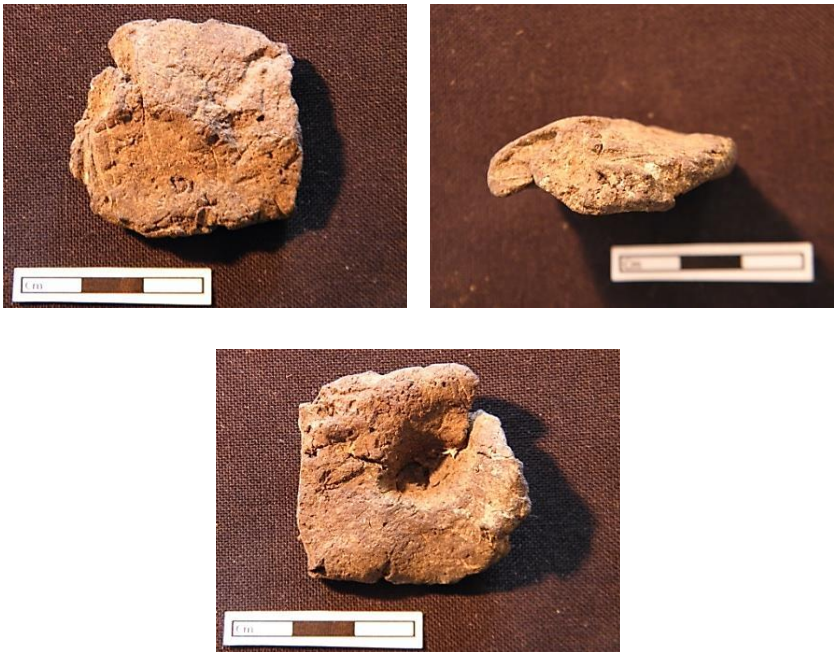


Figure 7.12: *Possible* sealing CO# 400 evidencing a characteristic, deep depression on the underside of the object. See figure A.D-15 for drawing. (Photographs: author's own).

Figure 7.13: Example of an object from distinctive cone set "A"; CO# 1080. Note the slightly concave base surface. Also see table A.C-4: Appendix C. (Photographs: author's own).

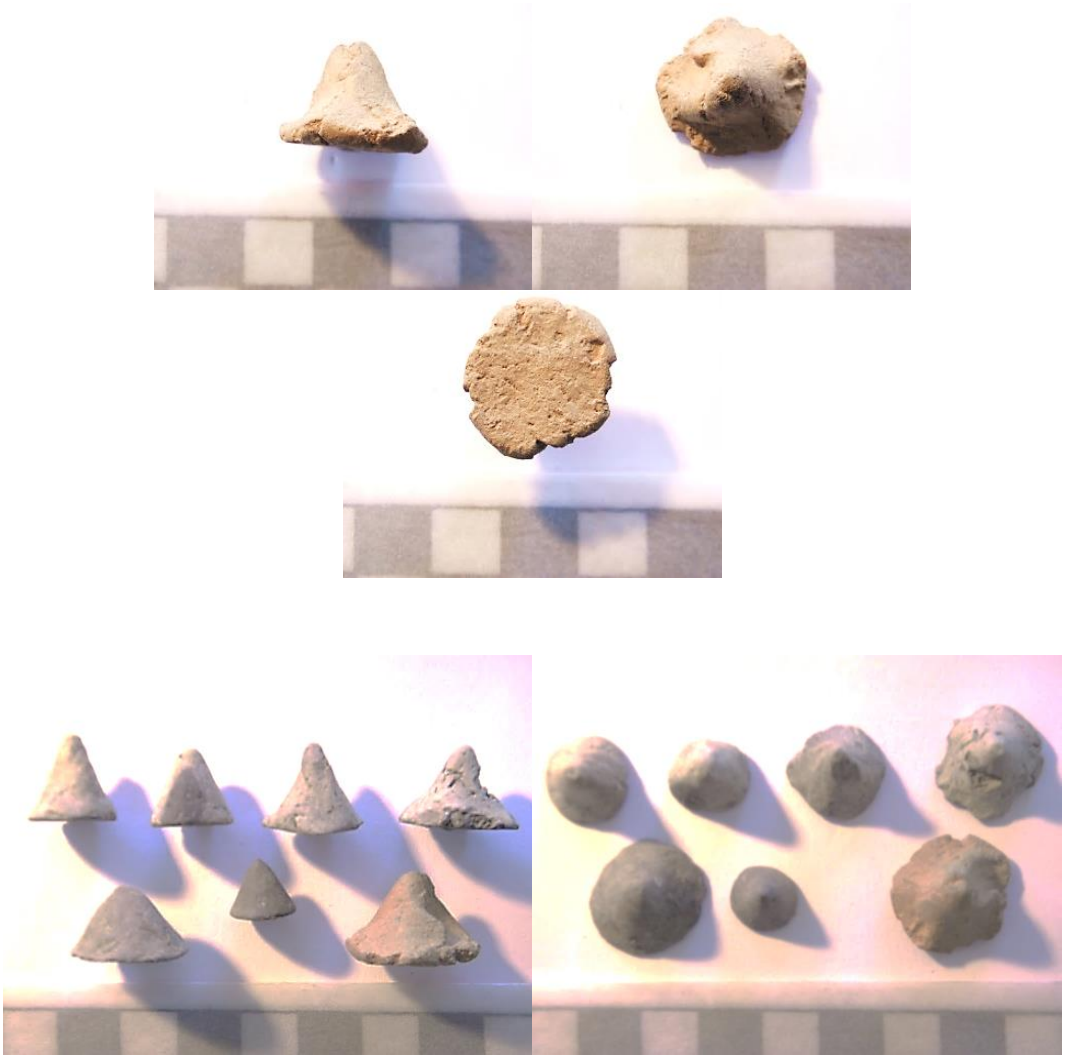


Figure 7.14: Selection of objects from distinctive cone set "B". **(Top)** CO# 1084. **(Bottom)** group of cones; left right, top to bottom- CO#s 117-1120, 1080, 1151, and 1084. Also see table A.C-5. (Photographs: author's own).

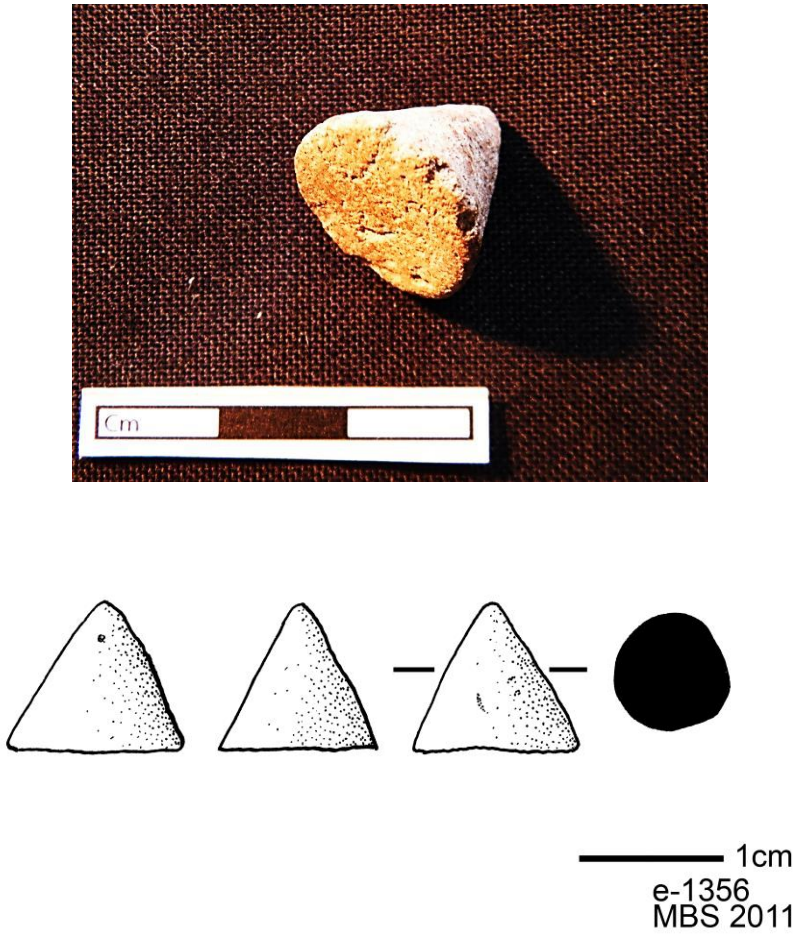


Figure 7.15: Two examples of cones from cone set "C" selection. Well finished with sides and base of even dimensions. CO# 1119. Also see table A.C-6. (Photograph: author's own). (Drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

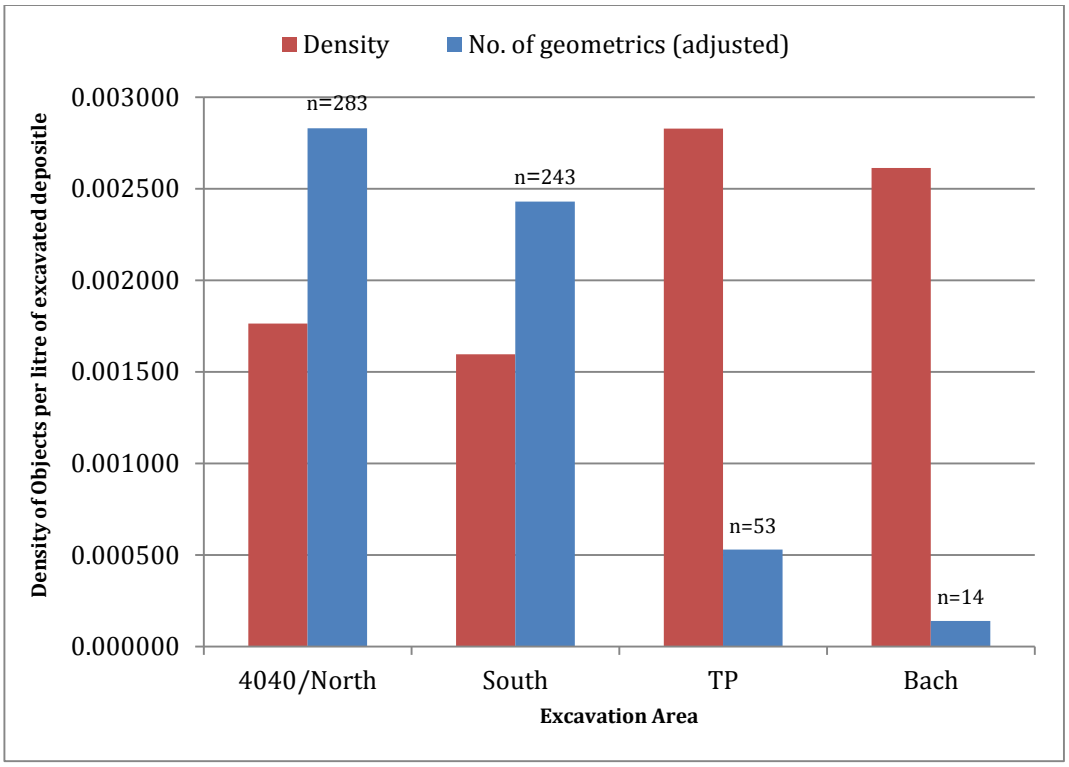


Figure 7.16: The density of small clay geometrics objects per litre of excavated deposit across the main excavation areas at Çatalhöyük East (red) compared to the actual number of recorded objects from each area (blue).

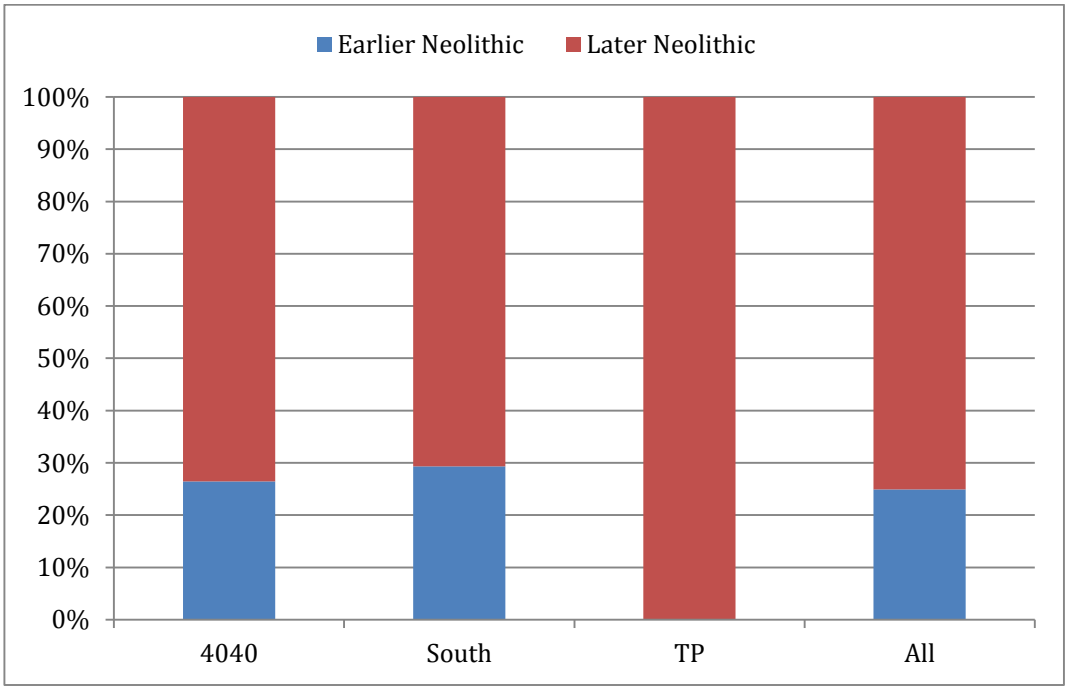


Figure 7.17: Proportion of objects (within each excavation area, and all three areas combined) from the *earlier* compared to the *later* Neolithic occupation phases.

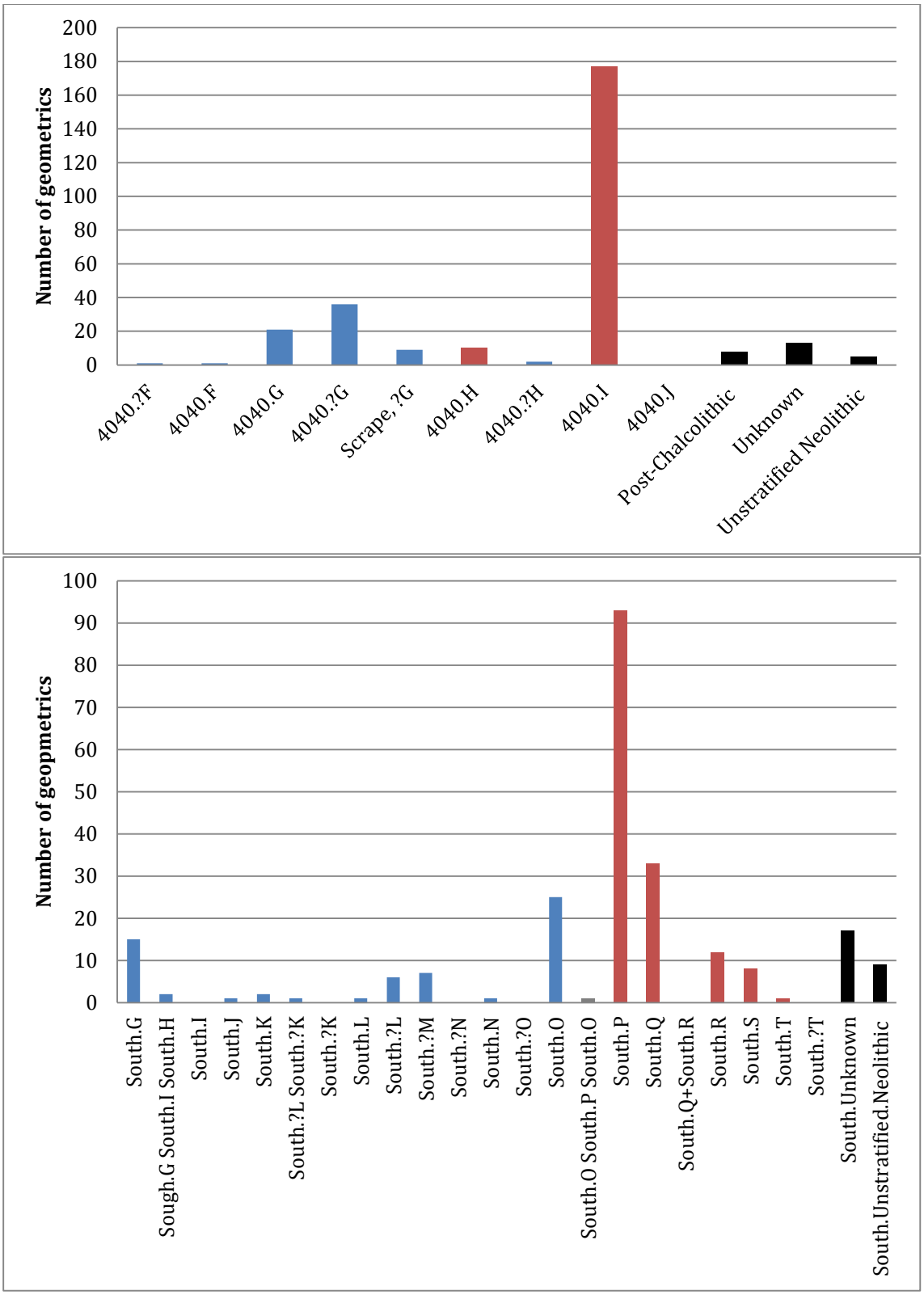


Figure 7.18: The number of objects by Hodder phase within each excavation area: **(top)** 4040/North Area and **(bottom)** South Area. Blue: *earlier* set of Neolithic phases beginning on the far left (roughly equivalent to Mellaart levels VI-XII). Red: *later* Neolithic phases with the upper most level on the far right (Mellaart levels V-I).

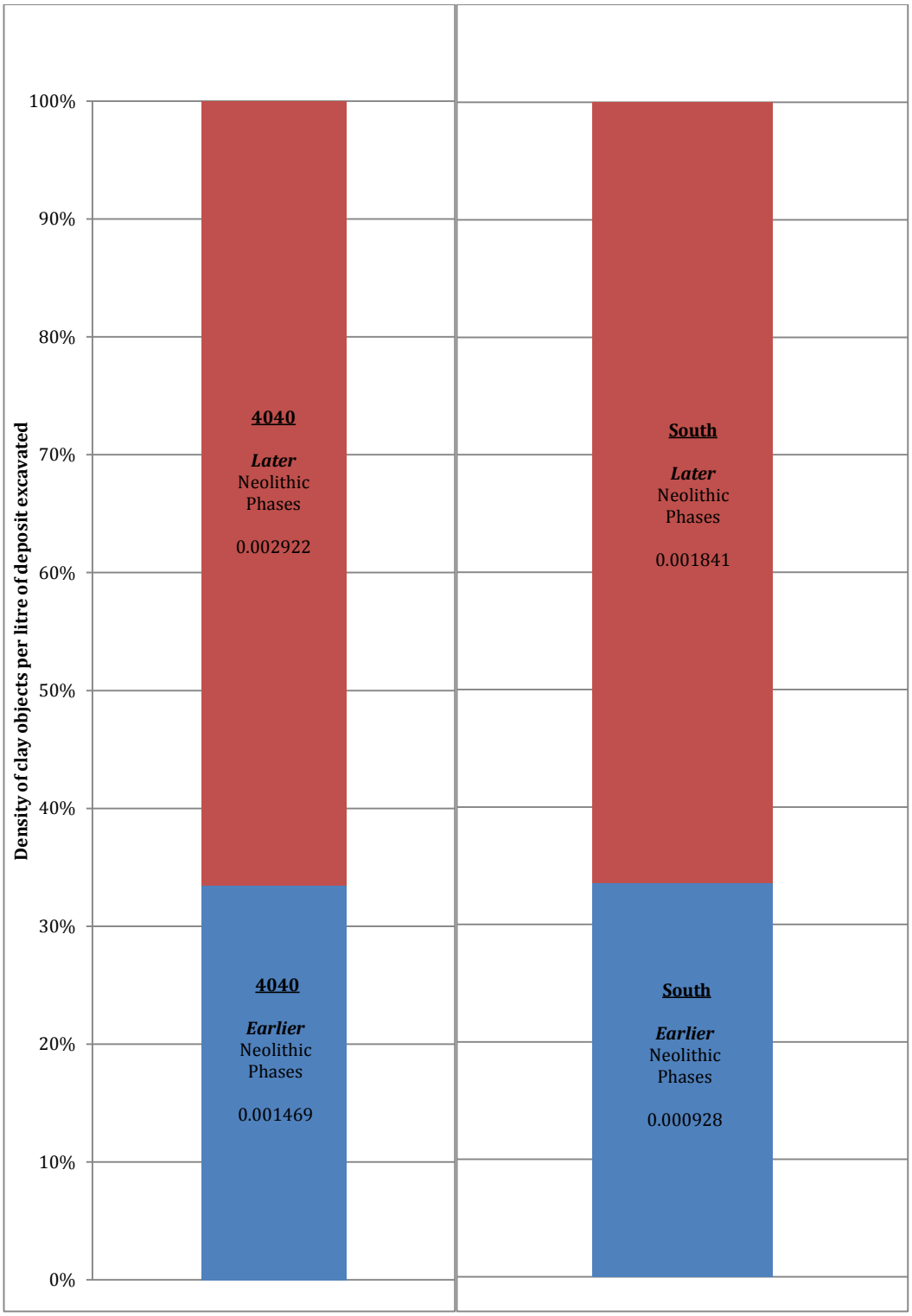


Figure 7.19: Comparison of object density (per litre of excavated deposit) across the broad Neolithic phases of the **(left)** North/4040 and **(right)** South excavation areas.

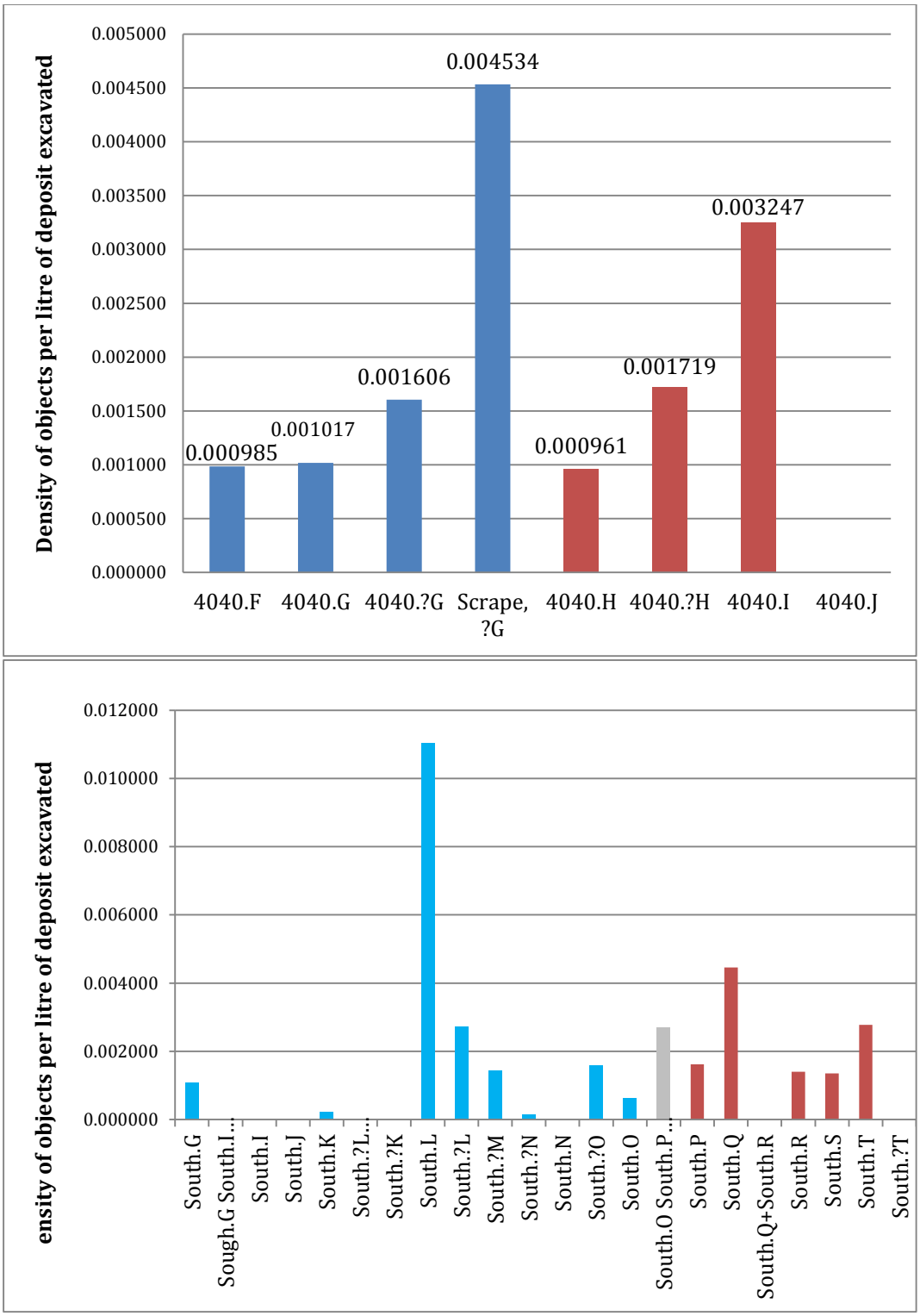


Figure 7.20: Density of objects (per litre of excavated deposit) with each Hodder phase of the **(top)** North/4040 and **(bottom)** South excavation areas (Blue=*earlier*, red=*later* Neolithic phases).

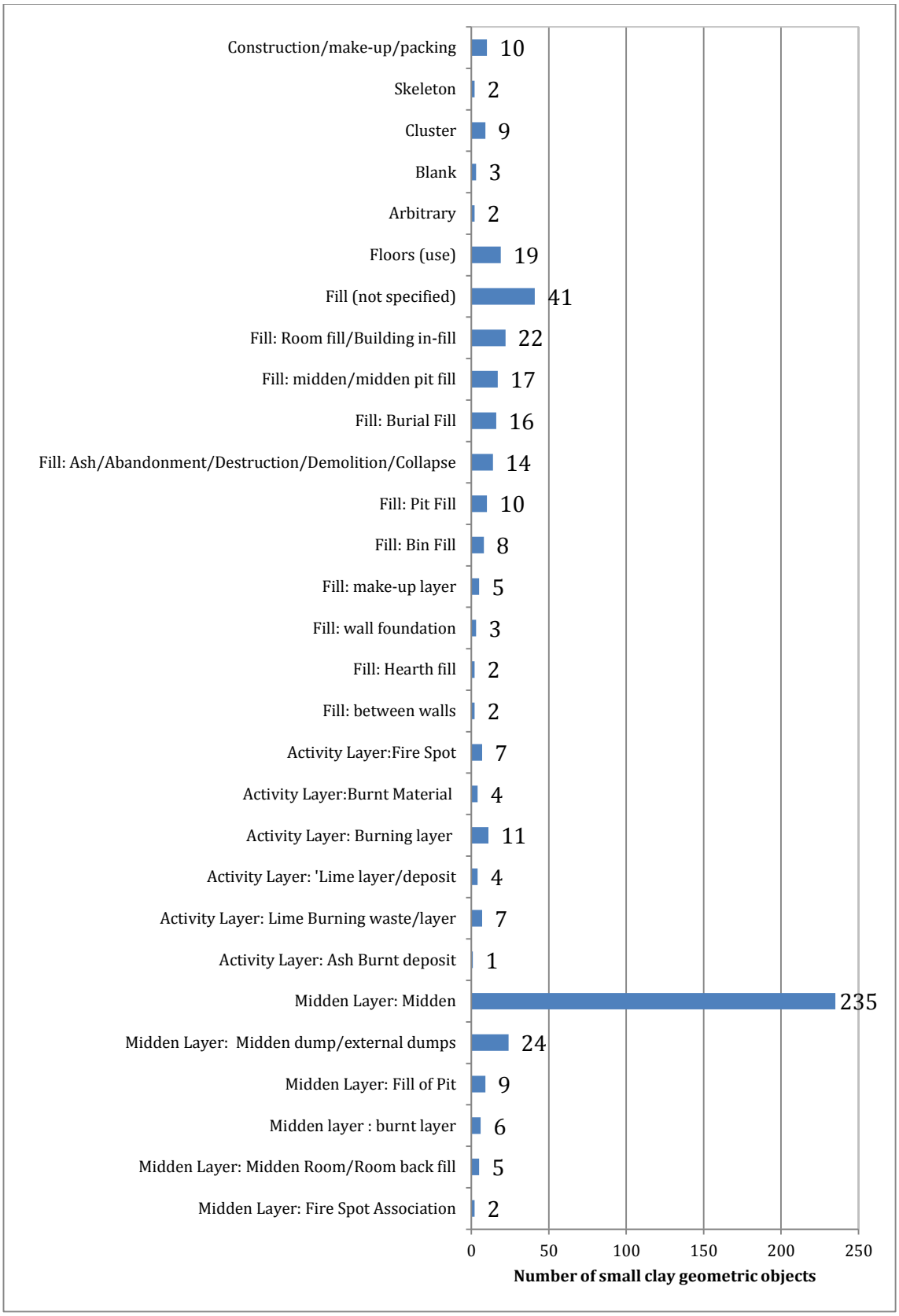


Figure 7.21: The number of objects from each context type; *Data Category* (activity layer, fill, midden etc.) and *Interpretative Category* (e.g. the *type* of fill or midden*)*.

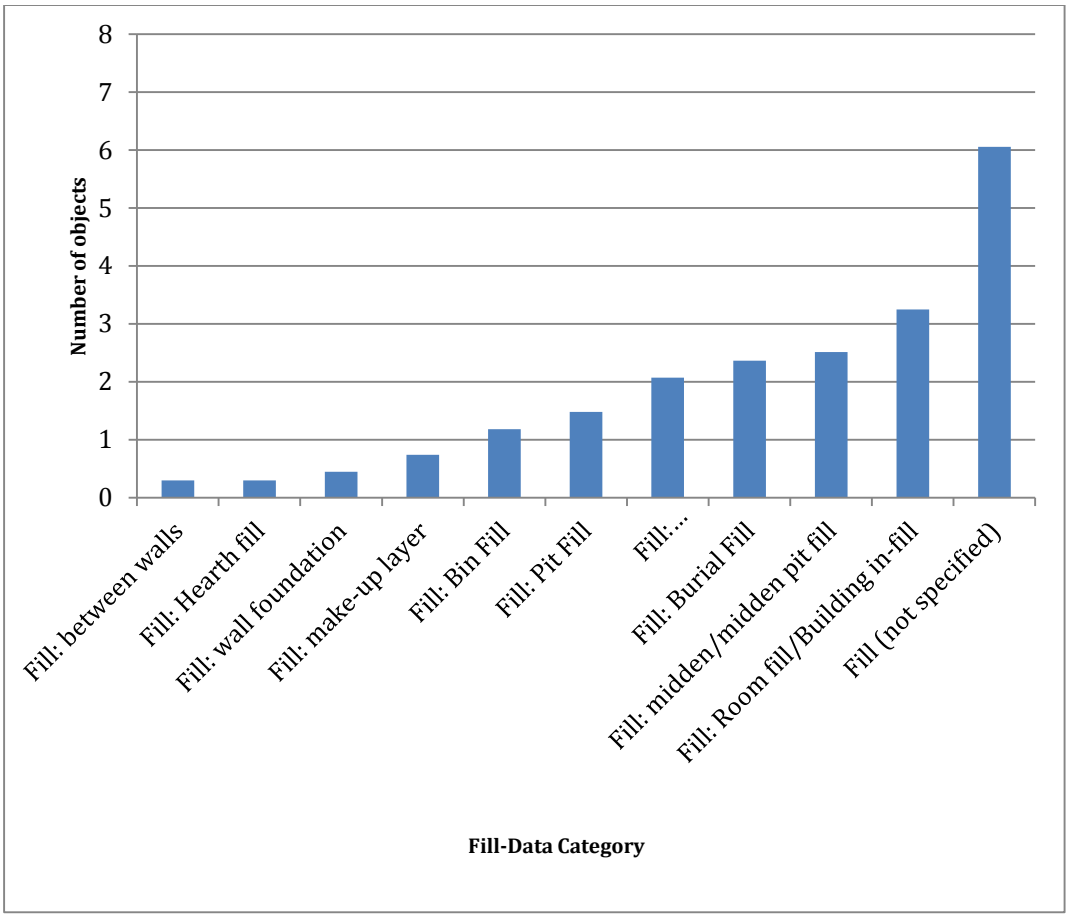


Figure 7.22: "Fill" objects *Interpretative Category*: the type of fill deposits small clay geometric objects were recovered from.

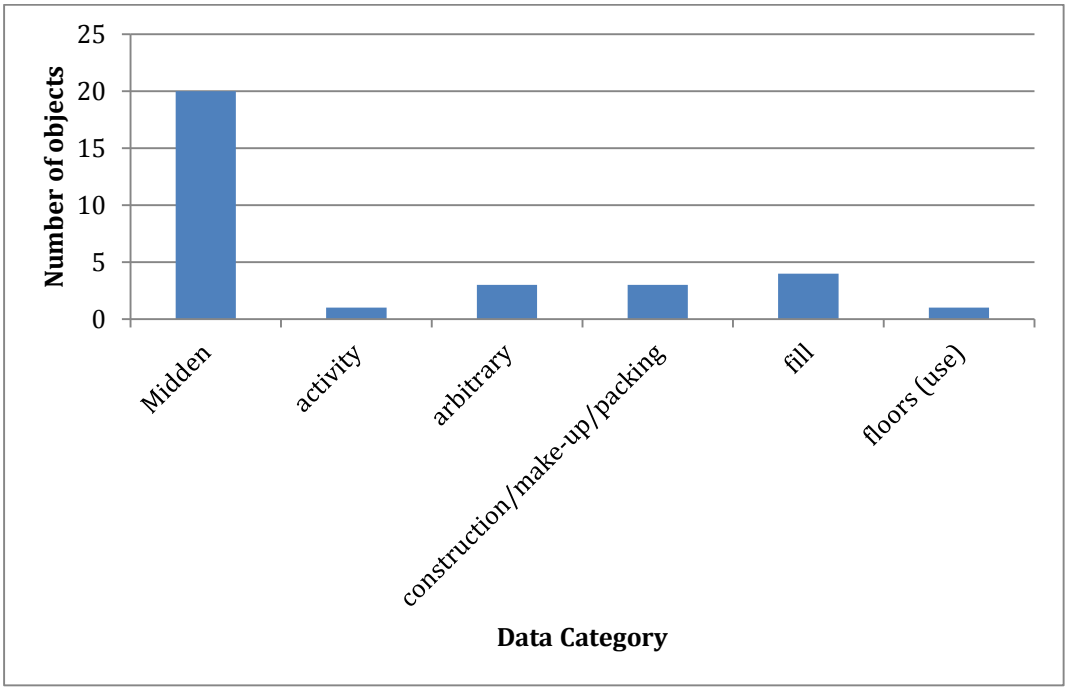


Figure 7.23: Objects with intentional, decorative markings: context type ("Data Category") of the 44 objects with markings.

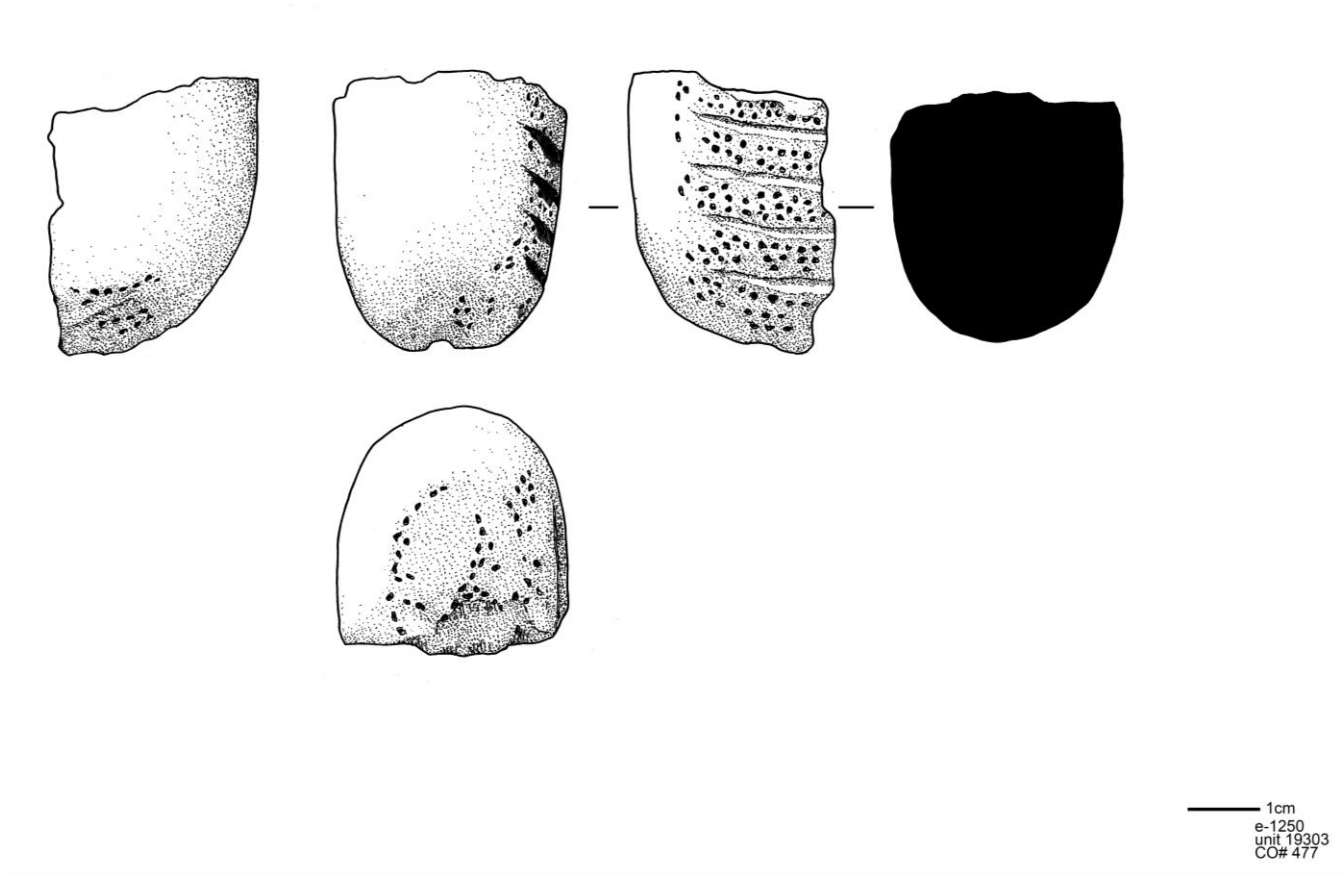


Figure 7.24: CO# 477, distinctive object, extremely well shaped, and intricately decorated with incised lines and holes. Only one half or one quarter of the original object remains, measuring 3.40cm x 2.60cm x 3.10cm (length, width, height). (Drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

TABLES:

3D SHAPE	NUMBER OF OBJECTS	PERCENTAGE OF ÇATALHÖYÜK OBJECTS
Sphere (inc. Semi/flattened)	220	32.50
Ovoid (inc. semi-flattened)	52	7.68
Disc (all 3 types)	236	34.86
Cube & Cuboid	8	1.18
Cone (all 5 types)	97	14.33
Cylinder	18	2.66
Other/misc./Unknown	46	6.79
TOTAL	**677**	**100.00**

Table 7.1: Table detailing the range of broad three-dimensional shapes evidenced within the Çatalhöyük assemblage and the number of objects of each shape type.

3D SHAPE	NUMBER OF OBJECTS	PERCENTAGE OF ÇATALHÖYÜK OBJECTS
Sphere	151	22.30
F. /S. Sphere	69	10.19
Ovoid	20	2.95
F./S. Ovoid	32	4.73
Disc 1	57	8.42
Disc 2	163	24.08
Disc 3	16	2.36
Cube	1	0.15
Cuboid/f. Cube	7	1.03
Cone 1	62	9.16
Cone 2	10	1.48
Cone 3	5	0.74
Cone 4	**4**	0.59
Cone 5	16	2.36
Cylinder	18	2.66
Other/misc./Unknown	46	6.79
TOTAL	**677**	**100.00**

Table 7.2: Table detailing the range of three-dimensional shapes including sub-categories at Çatalhöyük.

CLAY OBJECT NUMBER	SMALL FIND/OBJECT NUMBER	SEALING?	APPLIED TO	APPLIED TO ADDITIONAL COMMENTS	THREE DIMENSIONAL SHAPE	DIMENSIONS: PLAN VIEW-LENGTH (CM)	WEIGHT (GRAMS)	BURNT?	COLOUR
411	CH2004-11010-4040-CO5	Maybe	Unidentified Item (Definitely)	Base has a depression (0.30cm deep, 0.90cm long, 0.70cm wide) as if placed on an 3D object potentially as object is disc like in shape but has a slight arch upwards along the length of the base and the top (very shallow but marked "n" shape in section).	DISC 1 (flat/convex base and top)	2.95	7.00	No	Orange-Brown
1,351	14183.X6	Maybe	Unidentified Item (Definitely)	The interior surface has no impressions; it is smooth, very regular and seems to have been made by a smooth, flat object. Clear basketry impressions can be seen on one side of the top surface.	SHAPELESS/TOO FRAG./OTHER SHAPE	5.10	46.50	No	Black
1,122	15899.X1	Maybe	Unidentified Item (Possibly)	Flat base and the top, oval shaped object fragmented down one side. The top surface is flattened/smoothed, with a convex curve. It has sparse plant impressions and a deep and wide groove running the length along the fragmented side. The base has many deep	SHAPELESS/TOO FRAG./OTHER SHAPE	6.85	36.60	No	Dark Grey
942	CH2006-13141-4040-CO11	Maybe	Basketry (Definitely), Mat (Definitely), Plaited Mat (Definitely)	Strikingly clear impressions can be seen on the base of the object in the form of plaited basketry/matting. Function is unclear as the top surface is so smooth, and clear is does not appear to have been a sealing.	DISC 2 (flat base)	2.30	1.90	No	Mid-Grey
474	13139.H11	Maybe	Unidentified Item	Appears to have been applied to a curved object as base surface is	FLATTENED/SEMI-SPHERE	1.90	1.70	No	Dark Grey

			(Definitely)	slightly concave, with clear markings contrasting to the smooth top surface.					
481	CH2006-14096-South-CO5	Probably	Unidentified Item (Definitely)	A likely sealing? Outer surface has been made on a flat surface but is rough-worn and has an unfinished look. In contrast, the inner surface has a slight concave curve and the remaining surface has two deep, concave depression on it-too deep and narrow to	SHAPELESS/TOO FRAG./OTHER SHAPE	6.10	30.60	No	Mid-Grey
400	CH13139-4040-CO5	Probably	Unidentified Item (Definitely)	Appears to be a sealing. First rolled, flattened and then applied to a narrow object such as a bottle top. Base has a rounded 1cm wide by 1.10ch deep, regular depression. No impression visible.	DISC 2 (flat base)	3.90	11.30	Maybe	Black/V.Dark Grey

Table 7.3: Table summarising the seven three objects identified as *possible* sealings**.**

INTENTIONAL MARKINGS: DESIGN TYPE	NO. OF OBJECTS	% OF MARKED OBJECTS
TYPE 1: Straight, Independent Line(s)	18	40.91
TYPE 2: Straight Parallel Lines	9	20.45
TYPE 3: Straight Crossing Lines (squares)	2	4.55
TYPE 4: Straight Crossing Lines (diamonds)	0	0.00
TYPE 5: Zig-zag(s)	0	0.00
TYPE 6: Wavy Line(s)	1	2.27
TYPE 7: Round Depression(s) inc. stamp seal	6	13.64
TYPE 8: Incised Circular (complete or not) marking(s)	1	2.27
TYPE 9: Curved Line(s)	0	0.00
TYPE 10: Complete Hole(s)	3	6.82
TYPE 11: Matting Impression(s)	0	0.00
TYPE 12: Plant Impression(s)	7	15.91
TYPE 13: Detailed and intricate design (none of above) OR Irregular, Other, Clustered and/or Overlapping Markings	1	2.27

Table 7.4: Table documenting the different types of markings evidenced and the number and proportion of marked objects each appears on.

DESIGN-EXACT COMBINATION OF MARKINGS	NO. OF OBJECTS	% OF MARKED OBJECTS
Wavy Line(s)	1	2.27
Detailed and intricate design (none of above) OR Irregular, Other, Clustered and/or Overlapping Markings	1	2.27
Straight Parallel Lines, Round Depression(s) inc. stamp seal	1	2.27
Straight line(s), Detailed/intricate/other	1	2.27
Plant Impression(s), Straight Crossing Lines (squares)	1	2.27
Plant Impression(s), Straight Parallel Lines	1	2.27
Complete Hole(s), Incised Circular (complete or not) marking(s)	1	2.27
Plant Impression(s), Parallel lines.	2	4.55
Detailed/intricate/other	2	4.55
Plant Impression(s)	3	6.82
Round depressions	5	11.36
Parallel lines	7	15.91
Straight line(s)	18	40.91

Table 7.5: Table documenting the number of objects displaying the exact combination of markings listed.

CLAY OBJECT NUMBER	SMALL FIND/OBJECT NUMBER	SEALING?	APPLIED TO	APPLIED TO ADDITIONAL COMMENTS	THREE DIMENSIONAL SHAPE	DIMENSIONS: PLAN VIEW-LENGTH (CM)	WEIGHT (GRAMS)	BURNT?	COLOUR
411	CH2004-11010-4040-CO5	Maybe	Unidentified Item (Definitely)	Base has a depression (0.30cm deep, 0.90cm long, 0.70cm wide) as if placed on an 3D object potentially as object is disc like in shape but has a slight arch upwards along the length of the base and the top (very shallow but marked "n" shape in section).	DISC 1 (flat/convex base and top)	2.95	7.00	No	Orange-Brown
1,351	14183.X6	Maybe	Unidentified Item (Definitely)	The interior surface has no impressions; it is smooth, very regular and seems to have been made by a smooth, flat object. Clear basketry impressions can be seen on one side of the top surface.	SHAPELESS/TOO FRAG./OTHER SHAPE	5.10	46.50	No	Black
1,122	15899.X1	Maybe	Unidentified Item (Possibly)	Flat base and the top, oval shaped object fragmented down one side. The top surface is flattened/smoothed with a convex curve. It has sparse plant impressions and a deep and wide groove running the length along the fragmented side. The base has many deep	SHAPELESS/TOO FRAG./OTHER SHAPE	6.85	36.60	No	Dark Grey
942	CH2006-13141-4040-CO11	Maybe	Basketry (Definitely), Mat (Definitely), Plaited Mat (Definitely)	Strikingly clear impressions can be seen on the base of the object in the form of plaited basketry/matting. Function is unclear as the top surface is so smooth, and clear is does not appear to have been a sealing.	DISC 2 (flat base)	2.30	1.90	No	Mid-Grey
474	13139.H11	Maybe	Unidentified Item (Definitely)	Appears to have been applied to a curved object as base surface is slightly concave, with clear markings	FLATTENED/SEMI-SPHERE	1.90	1.70	No	Dark Grey

				contrasting to the smooth top surface.					
481	CH2006-14096-South-CO5	Probably	Unidentified Item (Definitely)	A likely sealing? Outer surface has been made on a flat surface but is rough-worn and has an unfinished look. In contrast, the inner surface has a slight concave curve and the remaining surface has two deep, concave depression on it-too deep and narrow to	SHAPELESS/TOO FRAG./OTHER SHAPE	6.10	30.60	No	Mid-Grey
400	CH13139-4040-CO5	Probably	Unidentified Item (Definitely)	Appears to be a sealing. First rolled, flattened and then applied to a narrow object such as a bottle top. Base has a rounded 1cm wide by 1.10ch deep, regular depression. No impression visible.	DISC 2 (flat base)	3.90	11.30	Maybe	Black/V.Dark Grey

Table 7.6: Table summarising the seven objects identified as *possible* sealings**.**

SITE AREA	NUMBER OF OBJECTS RECORDED	% OF EAST MOUND GEOMETRICS RECORDED	% OF ALL CH GEOMETRICS RECORDED
4040/North	283	46.78	40.72
South	243	40.17	34.96
IST	8	1.32	1.15
TP	53	8.76	7.63
Bach	14	2.31	2.01
Unstratified/Scrape	4	0.66	0.58

Table 7.7: Table detailing the number of objects recorded within each area of the site at Çatalhöyük.

AREA & BROAD PHASE (BASED ON HODDER)	**NUMBER OF RECORDED GEOMETRICS**	**% OF AREA'S RECORDED GEOMETRICS**
North/4040: *Earlier* Neolithic	68	24.03
North/4040: *Later* Neolithic	189	66.78
South: *Earlier* Neolithic	61	25.10
South: *Later* Neolithic	147	60.49
TP: *Earlier* Neolithic	0	0.00
TP: *Later* Neolithic	53	100.00
TOTALS	**518**	**% of all studied objects / % of phased object total**
***Earlier* Neolithic Phase**	**129**	**19.05 / 24.90**
***Later* Neolithic Phases**	**389**	**57.46 / 75.10**

Table 7.8: The number of objects within each broad Neolithic occupation phase and their percentage by area. Totals are given as a percentage of all recorded small clay geometrics and as a percentage of the number of objects from units with phasing data.

GENERAL CATEGORY	DATA CATEGORY	NUMBER OF OBJECTS	% OF RECORDED OBJECTS (n=677)
Layer	Midden	282	41.65
Layer	Fill	140	20.68
Layer	Construction/make-up/packing	56	8.27
Layer	Activity	34	5.02
Layer	Blank	34	5.02
Layer	Floors (use)	19	2.81
Layer	Arbitrary	16	2.36
Cluster	Cluster	9	1.33
Cut	Cut	**5**	0.74
Skeleton	Skeleton	2	0.30
Unstratified	Unstratified	8	1.18
TOTAL		**605**	**87.44**

Table 7.9: Context type (*General,* Data and *interpretative* category) recorded for the units containing small, clay geometric objects.

TYPE OF MIDDEN (INTERPRETATIVE CATEGORY)	NUMBER OF OBJECTS	% OF MIDDEN OBJECTS (n=109)	% OF RECORDED OBJECTS (n=677)
Midden Layer: Midden	235	83.33	34.71
Midden Layer: Midden dump/external dumps	24	8.51	3.55
Midden Layer: Fill of Pit	9	3.19	1.33
Midden layer : burnt layer	6	2.13	0.89
Midden Layer: Midden Room/Room back fill	5	1.77	0.74
Midden Layer: Fire Spot Association	2	0.71	0.30

Table 7.10: Table detailing the types of middens represented in the contexts yielding small, geometric clay objects.

CLAY OBJECT NUMBER	UNIT	AREA	GENERAL & DATA CATEGORY	INTERPRETIVE CATEGORY	FEATURE	BUILDING	SPACE	DETAILS *(from unit sheet)*
1066	17070	South	Cluster	Animal bone cluster	~	~	261	*"Concentrated grouping of animal bones".*
1067	17070	South	Cluster	Animal bone cluster	6061	77	336	*"Concentrated grouping of animal bones".*
410	11392	South	Cluster	Animal bone dump feasting deposit	~	~	329	*"Collection of animal bone and stone in NW corner of Sp. 261 within (11379)".*
1332	1082	South	cluster	Animal bone	~	~	329	*"Cluster of animal bone and clay balls ".*
1073	17079	South	Cluster	Bone deposit	~	~	329	None
906	17527	4040	Cluster	Cluster of stone	~	42	1	Cluster of stones-a possible basin: *"Moderate Charcoal flecks; occ. Charcoal lumps; occ. Daub and burnt brick fragments".*
1314	5417	South	Cluster	Pot	~	42	202	*"Whole pot set within floors associated with oven F.828 and platform".*
1315	5417	South	Cluster	Pot	~	42	202	*"Whole pot set within floors associated with oven F.828 and platform".*
1317	5417	South	Cluster	Pot	~	~	105	*"Whole pot set within floors associated with oven F.828 and platform".*

Table 7.11: Contextual detail of the "cluster" objects.

CLAY OBJECT NUMBER	UNIT NUMBER	CONTEXT DATA CATEGORY	CONTEXT INTERPRETIVE CATEGORY	BUILDING & FEATURE	DISCUSSION	SPACE	LEVEL	OBJECT DETAIL
333	13950	Fill	Fill	63	Heavily burnt storage area	283	IST.Unassigned	-Dark Grey -Flattened/semi ovoid
483	11608	Fill	Burial pit fill	B. 44 F.1343	Burial fill under platform Feature 1320	120	South.S	-Cone Type -Light-Brown-Mid-Grey -Well shaped, stands easily on end
499	11652	Construction/makeup/packing	Room makeup	44	Activity surface at earliest occupational level of the building.	120	South.S	-Disc Type 2 -Black/V. Dark Grey

Table 7.12: Detail of the context of three objects from within building fill-units 13950, 11608 and 11652.

CLAY OBJECT NUMBER	UNIT/X-FIND NUMBER	CONTEXT DATA/INTERPRETATIVE CATEGORY	AREA-BUILDING-SPACE-LEVEL	CONTEXT DESCRIPTION	ASSOCIATED OBJECTS
410	11392. X16	Cluster: animal bone dump/ feasting deposit	-South Area -Space 261 -Hodder Level: South.Q	Collection of animal bones from various *taxa.*	X-finds include animal bones of many varied elements, stone and worked stone. Other finds from the general midden area include: "*Domestic waste material, such as, pottery fragments, stone, animal bone, and obsidian waste. Personal and utilitarian objects: bead, clay balls (small and large), clay figurines, a greenstone axe fragment, horn core fragment, worked bone points, and worked obsidian blades and flakes and projectile points. Two pigment stones were also recovered"* (Unit sheet description).
444	12465. X2	Fill: fill	-IST Area -Space 295 -Hodder Level: IST.Unassigned	Room fill	Clay Ball and bone awl
476	13522. X13	Fill: midden	-TP Area -Space 432 -Hodder Level: 4040.H	Building in-fill	**Total of 26 x-finds:** -Stone object -Shell bead -Polished stone -Stamp seal -Polished stone -Worked bone -Obsidian object -Ground stone -Worked stone -Ground stone -Bead -Worked stone -Worked bone -Stone pendant -Ground stone -Ground stone -Ground stone -Flint tool -Pottery fragment -Polished stone -Bead -Spearhead -Awl -Polished stone -Spearhead -Stamp seal

Table 7.13: Detail of the context of the three objects recovered *in situ*: CO#s 410, 444 and 476.

CLAY OBJECT NUMBER	SEALING?	THREE DIMENSIONAL SHAPE	GENERAL CATEGORY	DATA CATEGORY	INTERPRETIVE CATEGORY	DISCUSSION *(from unit sheet)*	BUILDING NUMBER.	SPACE	HODDER LEVEL
400	Probably	Disc 2	Layer	Midden	Midden layer	*"Layer of midden overlying possible lime-burning horizon - dark band (dark brown/black) horizon of burning visible at base of unit. One small patch of lime and burnt horizon overlying the basal lime/burning horizon. "*	~	279	4040.H
411	Maybe	Disc 1	Layer	Fill	Midden Pit fill	*"Continue to remove fill of feature 1751 n. Half. Finish at 0.76 m from surface. Clayey level appearing. May be base. Filled with gravelly material. Some large pieces of burned clay some still left against outer wall (for safety). "*	~	1002	4040.Post - Chalcolithic
474	Maybe	Flattened/semi-sphere	Layer	Midden	Midden layer	*"Layer of midden overlying possible lime-burning horizon - dark band (dark brown/black) horizon of burning visible at base of unit. One small patch of lime and burnt horizon overlying the basal lime/burning horizon. "*	~	279	4040.H
481	Probably	Misc.	Layer	Construction/make-up/packing	Mortar	*"Mortar layer between mudbricks (14095). Wall removed down to next deposit (wall). Lower wall not numbered -1997 team. Mortar depth between courses quite thick. Between 1cm -2.5cm in depth."*	68	118	South.Q
942	Maybe	Disc 2	Layer	Activity	Burning layer	*"Light coloured layer overlying a horizon of burning which we're assuming at present to be in situ lime-burning. Very similar in appearance to the layers at the base of 12980 and 13103 and space 279. Samples taken to try and identify exact nature of this."*	~	279	4040.H
1122	Maybe	Misc.	Layer	~	pit infill	(none)	~	325	TP.Unassigned
1351	Maybe	Misc.	Layer	midden	Midden fill	*"Midden fill within pit [13148]. Same as (13104)"*	~	279	4040.H

Table 7.14: Spatial data of the seven objects identified as *possible* or *probable* sealings.

CLAY OBJECT NUMBER	THREE DIMENSIONAL SHAPE	WEIGHT (G)	LENGTH (CM)	MARKINGS?	UNIT, BUILDING, SPACE & HODDER LEVEL	CONTEXT DESCRIPTION *(from unit sheet)*
396	Other/misc.	10.80	2.50	None	-Unit: 13356 -Space: 298 -Building: 65 -Phase: South.Q	"Room fill in Space 298 of Building 65: a storage area containing 4 bins in it. The fill comprised lots of plastered brick pieces-the walls of the bins. No material was found on the bin surfaces. Below this was the floor level. *In situ* finds include worked stone, an arrow head, worked bone and a horn."
431	Other/misc.	1.50	1.50	The top surface has 4 straight, parallel incised lines spaced approximately 0.60cm apart and 1.40cm - 1.80cm in length. Inside these rows of lines are many small, incised holes which are marked deep into the clay but too narrow for the depth of them to be measured.	-Unit: 1008 -Space: 1001 -Phase: South. Unknown	"Unstratified human bone possibly eroded from section 6 in shrine 25. "
441	Other/misc.	3.70	1.65	None	-Unit: 12988 -Space: 279 -Phase: 4040.H	"External midden deposit in Space 279. Integrated with mudbrick demolition material in the SW corner of the space."

Table 7.15: Data summary: morphological and context information of the three squat cylindrical-shaped objects (CO# 396 431 & 441).

CHAPTER 8: TELL SABI ABYAD ANALYSIS

8.1-INTRODUCTION

Many thousands of artefacts have been excavated from Sabi Abyad over the countless excavation seasons. A filtered search of the Tell Sabi Abyad finds database returns over 1,535 records for "tokens" and small geometrics or other relevant classifications (see table 8.1. for site finds terminology. See Chapter 5 and Appendix E for methodology of object selection). The majority of these electronic records refer to a single object, yet others include up to 50 "tokens" under a single entry and "object" number. Therefore, the actual number of *recovered* small geometric clay objects (as defined for the study) from Tell Sabi Abyad is certainly much higher than the estimated 1,535. The true number including both retrieved and non-retrieved artefacts is most certainly a great deal larger than this, due to the site's restricted use of flotation and sieving in comparison to the other case-study sites (Chapter 4). A relatively small number of clay objects from the site have been studied extensively and published by the team (Akkermans & Verhoeven 1995, Akkermans 1996b, Verhoeven 1999, Verhoeven & Akkermans 2000).

Clay objects aside, Tell Sabi Abyad and its "Burnt Village" (see Chapter 4, section 4.3e and figures 4.3-16-17) is more well-known for it's many hundreds of clay sealings. These sealings were used in the conventional way-to seal the contents of a container or a bundle items together and the vast majority of the Sabi Abyad sealings bear stamp seal impressions. Over 300 examples have been published, and as these items are clearly identifiable, and cannot be easily confused with the clay objects, they have also been extensively published and as such sealings were not sought during analysis of clay objects at Tell Sabi Abyad. Information on the published sealings is summarised in table 8.2.

8.1(a) DATA SOURCES

The 393 Tell Sabi Abyad clay objects individually studied and recorded in the *Clay Object Database* (Appendix A) come from a variety of sources. 293 clay objects were studied in person at the site in the 2010 excavation season (figure 8.1). All clay objects excavated that season (from Sabi Abyad III) were studied, as well as an arbitrary selection of small geometric clay objects excavated in 2008 and 2009 (see Appendix E for full Tell Sabi Abyad objects selection and recording strategy). In order to increase the sample number of the Sabi Abyad case study, additional small geometric clay objects were recorded from publications (n=96). This was due to being unable to return to Syria and continue data collection as planned in 2011 and 2012. In addition, the unpublished finds documentation for 4 objects (shortlisted for study in the 2010 field season) were held,

and thus these objects too were recorded from their descriptions, photographs and sketches. These 100 objects recorded from documentary sources are the Tell Sabi Abyad tier 2 data, recorded in as much detail as available (figure 8.1 and Appendix E).

8.1(b) ANALYSIS, CONSTRAINTS & CONSIDERATIONS

In interpreting the data, consideration of the differing nature of Tell Sabi Abyad's differing assemblages needs to be taken into account. The tier 2 objects are not assumed to be representative of the range of small geometrics from Tell Sabi Abyad. Those objects selected to be illustrated in publications, the 96 objects published as "tokens", are likely to be the most complete, well-crafted, aesthetically pleasing and possibly more unique examples of small clay objects excavated. Also, the tier 2 objects include small geometric clay objects recorded by the Tell Sabi Abyad team under a range of terms (see "Tell Sabi Abyad" Chapter 5.5b) whereas almost all tier 2 and 3 studied objects contained only objects classified on-site as "tokens". As such they are likely to be less diverse. Four "bullae" were also selected by myself from the huge archive of site notes, expressly due to their unique nature within the broader site finds assemblage. Therefore, like the 'Ain Ghazal tier 2 assemblage (see Chapter 9.2), the tier 2 Tell Sabi Abyad assemblage should be seen as a selection of the more remarkable, well preserved and better crafted objects within a much larger, more diverse collection of small, geometric clay objects.

Arbitrarily selected, the tier 1 Tell Sabi Abyad collection should be far more representative of the estimated >1,000 small clay recovered. However, there are also problems with this data. Although object recording was not selective for the 293 tier 1 objects recorded on site, they were randomly selected from only three excavation seasons and correspondingly just two site areas. As the site is so large – comprising a number of tells – it likely consisted of a number of villages with overlapping occupation periods. The fact that the 293 clay objects represent finds from only two different areas means that again, an arbitrary and representative sample of all types of clay objects from Tell Sabi Abyad's four mounds and 1,000 years of occupation is not present. This is especially true if on different parts of the site, and in different phases of occupation, different subsistence strategies, behaviours and symbolic beliefs were employed; and therefore differing functional uses for these objects might plausibly have been utilised. However, as the actual objects recorded were not selected due to their state of preservation, special appearance or high level of craft; within this assemblage, it is to be expected that the objects will be more diverse and have a higher proportion of crudely made, incomplete, and plain objects.

8.1(c) ADDITIONAL DATA SOURCES-TIER 3

As a result of the current troubles in Syria it was decided (by the excavator) to digitise the huge Tell Sabi Abyad archive and publish as much of the information as possible. However, the results of this will not be available immediately and therefore the gathering of basic data at a third level; tier 3 was undertaken. The main purpose of this information was to provide an approximate total number of clay objects (as classified as "tokens" by the excavators) and other small, geometric clay objects (given alternative functional designations), in order to assess what proportion of the sites' geometrics had been studied in person, and at tier 2 level, and therefore to understand how representative the recorded proportion is of the projected total assemblage. Tier 3 data was gathered from both published information (table 8.3) and from the Tell Sabi Abyad Finds Database (figure 8.1).

There are some considerations to be made with the tier 3 information however. Some of the 1,535 site finds database records cover groups of objects, others single objects, thus totals from this are estimated counts only. Likewise, the site finds database objects are not drawn, nor described, and therefore it is likely that a proportion do not fit the clay object selection criteria of this project; likewise some objects which are relevant will be excluded from the total number (by being classified as a "figurine" for example). Therefore, filtering this information by mound, level, excavation square and locus-lot may give an inaccurate picture of the distribution of clay objects. Contextual analysis was not carried out the tier 3 objects, only the objects from tiers 1 and 2. Information from the 273 published tier 3 objects was also incorporated into conclusions made from this analysis where relevant. As the range of analysis available for the tier 2 assemblage (objects recorded from published and unpublished site records) is far more limited than for the objects recorded on site (tier 1), this chapter begins with an overview of the morphology of the tier 2 objects, followed by a more detailed analysis of the morphology of tier 1 objects. Next the context of all objects is analysed, again with tier 1 undertaken in more detail. Additional illustrations from the Tell Sabi Abyad analysis can be found in Appendix F.

8.2-OBJECT MORPHOLOGY

8.2(a) TIER 2 (PUBLISHED) GEOMETRICS

Overview

The tier 2 Tell Sabi Abyad assemblage comprises 100 objects. All share a high degree of standardization in various aspects most notably in their shape definition and high level

of finish, due mostly due to these objects being selected for publication. The tier 2 object count includes four, clearly identifiable and larger objects, grouped under the "token" count in publication (Akkermans, Brüning *et al.* 2012: 314, 316, fig. 7, tbl. 2) – classified as "bullae" (CO#s 2915-2918). Each "bulla" consists of more than one fragment, yet as the fragments clearly fit together, forming four distinct objects, each "bulla" is recorded as only one clay object in this study, recorded from detailed sketches, photographs and descriptions from unpublished site records (gathered in advance of the cancelled 2011 excavation season).

TIER 2: BASIC CHARACTERISTICS

(i) Raw Material & Basic Three-dimensional Shape

The overwhelming majority of objects recorded at tier 2 were made from sun-dried clay (89.00%). None of the published objects are reported to have been fired. In addition to clay, 6 of the 100 tier 2 objects were crafted from stone. Identified stone types include marl (CO#2850), gypsum or rock crystal (CO#2879) and limestone (CO#s 2913 and 2914). The assemblage is diverse in three-dimensional shape, with all of the pre-set shapes represented (see figure 8.2 and table 8.4). Spheres are the most common, 27.00% of all tier 2 objects (figure 8.3), yet shapes that are less common or absent in other site assemblages, such as cones (figure 8.4), cubes, cuboids and all cone and disc sub-types are present. The shape groupings are highly standardized within the tier 2 Tell Sabi Abyad assemblage, with regular ratios of length, width and height within each shape category, giving the objects a consistent appearance within each shape grouping (see for example figures 8.10 and 8.11). This is in stark contrast to the other case-study sites (see Chapters 6 and 7), and also slightly more evidence in the tier 2 than the tier 1 Tell Sabi Abyad objects (see later in this chapter). A large proportion (compared to other assemblages) of "shapeless/too fragmented/other" well executed shapes and shape groupings are also present (22.00%).

(ii) Shape & Material

The 6 stone objects represent a number of shapes, almost all of which are also represented by clay in this assemblage. Two are spheres, one is a cylinder and one is a type 3 cone (with square base, see figure 8.5). The cone (CO#2879) is published as a possible unfinished stamp seal. More unusual shapes include a rather well shaped cube (CO#2914, figure 8.6) and a two dimensional triangle (figure 8.7). The objects recorded in the final category; "shapeless/too fragmented/other" at tier 2 differ from objects found in this category in other assemblages including the tier 1 Tell Sabi Abyad data, not

only in their increased proportion (22.00%) but also in their form. A number of different forms are present, yet all objects within this category are well defined shapes, rather than being a fragment of a once complete yet uncertain geometric shape, or a miscellaneous shape. 13 of the "other" shaped small geometrics are not actual geometrics in the strictest sense. CO#s 2883, 2884, 2886, 2887 and 2889-2897 are published as "miniature vessel [or] jar [or] bowl, token" (figure 8.8). Though miniature vessels are generally not recorded in the *Clay Object Database*, these examples are far too small and the depression is far too shallow to have acted as a vessel in practice. The "miniature vessel, tokens" vary in form, yet all are clearly only representations of vessels, and as such are included in the database as their function is unclear and they may have been utilised in the same way as some or all of the other small clay objects at Tell Sabi Abyad (note a small number of miniature vessel-like objects were also recorded from the Çatalhöyük tier 1 material-see Chapter 7).

(iii) Dimensions & Shape

All objects recorded at Tier 2 level are small, with average dimensions of 2.88 cm (length), 6.80 cm (width) and 3.90 cm (height/thickness) and a maximum dimension of <10 cm (figure 8.9). The four "bullae" are the exception to this rule. They fit within the small dimensions outlined above as they survive only in fragmentary form. The dimensions of the largest fragment of each item was recorded, and it is clear the intact object would have been far larger than the average dimensions given above (see below for full discussion of these objects). Looking at specific collections of tier 2 objects helps assess how well defined each set is.

Clear variation can however be seen between the spheres and flattened/semi-spheres when considering object length compared to height; spheres retain even proportions between the two values, whereas the flattened/semi-spheres have a consistently lower height than width. The single stone cube shaped object (CO#2914) is extremely well shaped with flat sides and rounded corners. It falls within the middle of the sphere size range-yet is deliberately cube shaped, rather than being an unfinished sphere; as suggested by the regularity of the size and relative dimensions of the cube (figure 8.10). The 17 objects published as "miniature" vessels also cover a limited range of dimensions, showing that like the spheres, all are very similar in size, the ratio of length, width and height, and therefore in overall appearance (see Appendix F, figure A.F-12). All cones (n=18) are very similar in the proportion of the base measurements (length and width in plan view). This is true not only for the n= 8 type 1 (round base) cones, but for all cone

sub-types (figure 8.11). There is greater variation in cone height compared to base size, however, this does not vary according to the overall cone shape or sub-type (base shape, flared, pinched or straight sides). Despite a high degree of shape standardization, each shape is represented by objects of various sizes. Size groupings are not apparent, with objects graduation in size within the parameters of the study specifications (<5 cm).

TIER 2: CRAFT, "MARKINGS" & OTHER ELABORATIONS

(i) Craft, Burning & Fragmentation

The small geometric clay objects recorded from publications, n=96 (excluding the 4 bullae, see below) appear to have been simply crafted by moulding clay in the finger tips and palms. The presence or absence of fingerprint markings is not detailed, nor visible for any of the tier 2 objects. However, illustrations show that two of the tier 2 objects; one of the bulla (CO#2917) and a semi-sphere/disc shaped object (CO#2828) have a depression on one surface, where a fingertip was impressed onto the clay leaving a rounded, concave mark. In the case of CO#2828, this appears to have been done deliberately as part of the object's shape. Many, if not all, of the "miniature vessel-shaped" clay objects also have a concave depression in the top surface-some of these the depression is very shallow, it is little more than the imprint of a thumb or finger, in others it is deeper. Although the craft technique is neither clear from the illustrations nor detailed in the publications, it appears a simple fingertip or thumb impression caused these depressions.

Neither the presence of burning, nor the colour of the objects, is remarked on in any of the tier 2 objects recorded from publications, yet burning is mentioned for one of the bullae recorded from site notes. It is also likely many more tier 2 objects were burnt, due to many coming from burnt contexts. Little descriptions of the clay type and surface, such as whether or not the clay is smooth, polished or has a worn surface, or regarding the clay texture is found. The presence or wear of adhering material is published with reference to two of the stone objects. CO#s 2913 and 2914 are described as having "battered surfaces" and the latter has traces of ochre on its sides. It can therefore be assumed (tentatively) that these characteristics are rare within the published tier 2 assemblage as a whole and therefore published along with illustrations when present.

The vast majority of tier 2 Tell Sabi Abyad objects exhibit a high degree of completeness. Only 4 objects (4.00%) are less than 75% complete. All other objects are complete, or only display a small chip, cracks or fragmentation (figure 8.12). Considering the pre-set

three-dimensional shapes and completeness, no shapes are more likely than others to be at greater risk of being fragmented or not. However, if the "other" group is broken down, it is clear the bullae constitute three of the four objects most highly fragmented (the other is a cuboid: CO#2912). All four bullae are broken. Though none can be completely reconstructed, all exist in a number of large fragments which fit together.

(ii) Markings

A higher than usual number of the tier 2 Tell Sabi Abyad objects display the presence of seemingly deliberate, decorative markings in the form of impressed or incised decoration. 9 objects (9.00%) of the Tier 2 collection display markings. In contrast, none of them (as can be gleaned from the drawings) have impressions. Markings are found in three forms: round depressions (n= 7), single straight line (n=6) and single straight line and parallel line sets combined (n=1) (see table 8.5). However, the design found on each object is distinctive, and there are no two objects with identical sets of markings. Where clear, the markings are applied with a finger, fingernail or other instrument (n=4). Most of the marked objects have more than one marking; being located on the top and/or around the sides of the object (see table 8.5 and figure 8.13). As well as the 9 objects mentioned above, a further object (CO#2835) has what appears to be intentional markings in the form dashes-possible fingernail impressions in a ring around the top edges of the semi sphere, and 2/3 further fingernail impression on the top surface (this object is published alongside others where the presence of intentional markings and fingernail impression is mentioned – suggesting these markings are merely cracks in the clay and not intentional, see figure 8.13).

(iii) Fingernail Decoration

Three of the nine objects with markings definitely display fingernail impressions; CO#s 2851 (sphere), 2852 (semi-ovoid) and 2862 (semi-sphere). In all three instances the pressing of a fingernail into wet clay, in order to leave a mark on the object appears to be intentional and decorative (as opposed to accidental whilst crafting the object), especially in the case of CO#s 2851 where the markings are arranged in a ring around the object (figure 8.14). Similar use of fingernails in decoration is seen in the tier 1 Tell Sabi Abyad assemblage where at least 25 objects (8.53% of tier 1) have at least one seemingly intentional fingernail impression (see later in this chapter).The three-dimensional shape of the objects with fingernail markings supports this theory as a rounded objects could be easily made within the palms, and an accidental fingernail impression being left on the surface is unlikely, indeed far less likely than in the crafting

of other shapes where more manual manipulation of the clay in order to achieve the desired shapes would be necessary – in the case of the cubes and cones for example. Notably, of the nine tier 2 Tell Sabi Abyad objects with markings: 77.78% of them are rounded in shape (spheres: 2, flattened/semi-spheres: 4, flattened/semi-ovoid's: 1). However, he cylinder (CO#2911) and cuboid (CO#2912) both also display distinctive and undoubtedly intentional markings (see below).

TIER 2: NOTABLE OBJECTS

(i) Notched Stone Cylinder

A number of objects stand out from those published as being distinct, or unique among the assemblage aside from the cube shaped "hammer-stone" object with ochre (CO#2914 discussed above). One of the 6 cylinders, CO#2911 is unique for a number of reasons. At 8.70 cm in length, it is almost twice as long as the other cylinders (which range between 4.30-5.00 cm length). It is the only cylinders to be made of stone – and the only one to display markings. Interpreted as a possible "tally", this cylindrical object has 8 incisions in the form of thin, linear notches, running in two rows along the length of the object. In addition to these notches, the object has a faint, incised line running down its entire length and appears to either be hollow, or have a partial hollow at the top, as if it was created by rolling together a sheet of clay-yet this object is made from stone (Verhoeven 2000: 108) (figure 8.15). No other object like this one has been excavated from Tell Sabi Abyad.

(ii) Decorated Cuboid, the "Game Piece Token"

Another notable published object is the "game piece". The object is the only cuboid shaped object within the Tell Sabi Abyad assemblage (tier 1 and 2). Described as a "flat rectangular object", CO#2911 measures 2.90 cm (length) x 2.30 cm (width) x 1.50 cm (thickness). It has 8 rounded incisions on one surface. These incisions are in two rows of four. The object is fragmented along its length and it appears a third row of 8 incisions was present as part of two further holes can be seen in the fragmented surface (figure 8.16).

(iii) "Bullae"– Like Objects

All four of these objects (CO#s 2915-2918) were recovered in fragments (consisting of 1 to 5 fragments per object), yet as it was clear each set was originally part of a single object each fragment was not recorded separately, but combined as one item and treated as one object for the purpose of analysis and comparison. The objects are labelled as "bullae"

(by the excavators and in this study) due to their strong resemblance to the round or cylindrical, hollow balls often found at sites in South Mesopotamia from the late 4th millennium BC onwards. All remaining pieces of each object (aside from CO#2916) can be slotted together to recreate the original, spherical shaped, hollow item, yet in all cases, only a fraction of the complete object remains (figure 8.17a-c). The dimensions of the largest fragment of each bullae is between 4.00-9.00 cm (length and width) with a variable yet average fragment thickness of around 3.00 cm. Without seeing the bullae in person, their size when intact is difficult to estimate, yet it is speculated one bulla could be held in the hand-perhaps filling the entire palm and outstretched fingers, thus similar in size to a grapefruit (table 8.6). All four of these objects appear (from the site notes, photographs and sketches) to be of the same fabric and finish. One is described as being heavy in organic inclusions which have left scars in the clay. This can be seen on sketches of all of the bullae. The exception to fabric and finish homogeneity is the two fragments from CO#2916 which are both heavily burnt-red, in contrast to the other 3 fragments from this object, and all fragments from the other bullae.

Fragment 2 of CO#2917 has a depression on the outer surface. This is small and appears to be an incidental fingertip depression. Two of the three fragments of CO#2916 are described as having a "seal impression" on their outer surface. The photographs do not suggest this is a stamp seal impression, but clearly deliberate markings in the form of incised lines. The interior, concave surface of the bullae is more intriguing; each example has deep oval or round depressions where it appears that spherical or ovoid shaped objects have been pressed into the interior surface of the objects. Both the shape and size of these depressions matches many of the studied geometric clay objects from Tell Sabi Abyad (figure 8.17a-c and table 8.6). The location of these depressions, on the interior surface of the bullae means their presence would not have been immediately visible. Yet the depressions are deep and deliberate, not made to enhance the objects' shape, outward appearance nor as a by-product of crafting. The most likely explanation for the depressions is to hold the contained clay objects in place, preventing damage to them whilst in transit. This is supported by evidence from 4th millennium (Late Uruk period) Choga Mish (see map figure 4.1). Many bullae or "envelopes" and clay objects (loose and sealed inside bullae) have been recovered from this site. The bullae often contain a coarse sediment-acting as padding. The interiors of other bullae have traces of bitumen slip and linen, all are interpreted as preventing the movement of and subsequent damage to the clay objects inside and clay objects within Choga Mish's bullae which contain no form of padding are often broken (Woods 2014).

8.2(b) TIER 1 (VIEWED) GEOMETRICS

BASIC CHARACTERISTICS

(i) Three-dimensional Shape

The objects viewed in person from Tell Sabi Abyad (tier 1: n=293) cover a wide range of three-dimensional shapes. All seven of the basic shape categories are represented (figure 8.18). Rounded objects dominate, over half of all tier 1 Sabi Abyad objects (50.17%). 112 of the objects are spheres (38.23%) and a further 35 (11.95%) are classified as ovoids. After spheres, discs (all three sub-types combined) are the most numerous (n=70 or 23.89% of the assemblage, figure 8.18).

In three-dimensional shape, the tier 1 assemblage is less diverse than studied collections from other sites. Objects are present in all but two of the pre-set shapes; cuboid and type 3 cone. However, a number of other shapes are represented in very low numbers. Fully rounded spheres dominate the assemblage, constituting nearly one quarter of all objects (70 or 23.89%. Figure 8.19 and table 8.7). Two shapes, flattened or semi-spheres along with type 2 discs are the next most numerous, present in almost equal proportions; 42 (14.33%) and 40 (13.65%) respectively. Four further shapes are found in reasonable numbers: disc type 1 (27 objects, 9.22%), miscellaneous (26, 8.87%), ovoid (24, 8.19%), and cone type 1 (21, 7.17%). All other shapes are represented by 15 objects or less (see table 8.7 and figure 8.19).

Spheres (as a broad category including flattened/semi spheres) constitute almost the same proportion of objects within both the tier 1 and 2 assemblages from Tell Sabi Abyad (tier 1: 38.23%, tier 2: 38.00%. Figure 8.19), although when each type of sphere is considered individually, the viewed (tier 1) assemblage has a slightly higher proportion of flattened/semi-spheres (14.33%) when compared to the tier 2 assemblage. In all other aspects, the proportion of three-dimensional shapes across the two assemblages differ. The tier 2 assemblage is also more diverse in the range of shapes, containing all 16 types. These differences are most likely explained by the different natures of the two sets of objects-the tier 2 objects being specifically selected, and thus incorporating as wide a range of all the possible shapes in which clay objects are found. Yet the fact that spheres constitute almost 40% of both collections suggests this is a real reflection of the nature of the larger Tell Sabi Abyad small geometric object collection as a whole.

(ii) Size & Weight

In size, the tier 1 objects have an average dimension of 1.50 cm to 2.50 cm. No object has a maximum length of more than 5.80 cm and the minimum thickness is 0.35 cm. 98.29% have a length of <5.00 cm and 99.32% of objects are no wider than 5.00 cm. This contrasts to other viewed assemblages where a small sample of recorded object fall above the estimated maximum "token" size; perhaps because at this site sealings and possible/potential sealings were not recorded onto the *Clay Object Database*. Tier 1 contains a very small proportion of tiny objects, with 98.00% measuring >1.00 cm in length. The objects are more diverse in weight, ranging from 0.20g to 31.20g; just over half (51.88%) of objects weigh between 1.00-6.49g. This increases to 71.33% between 1.00 and 10.00g.

(iii) Shape, Size & Weight

There is some differentiation in weight according to an object's shape, with some shapes completely absent from the larger weight ranges. For example, no ovoids weigh greater than 14.00g and only 1 cone weighs more than this (figure 8.20). Within each three-dimensional shape category, other differences of size are evident. The distinct nature of the rounded objects is highlighted by analysis of the weights of ovoids, flattened/semi ovoids, spheres and flattened/semi-spheres. Each is a distinct shape, not a slumped, squashed or imperfect version of a sphere. Spheres and flattened/semi-spheres mirror each other in terms of their weight patterning aside from in the lightest three bins. Here, more than half of the spheres weight less than 6.00g (52.86%) compared to only 35.7% of flattened/semi-spheres showing that overall, spheres are far lighter than their flattened counterparts (figure 8.20). Flattened/semi-ovoids are present in consistently low numbers over the entire range of weights up to 24.00g. Yet full ovoids are almost entirely clustered in three weight ranges: 2.00-3.99g, 10.00-11.99g and 12.00-13.99g (figure 8.20).

Shape Definition & Standization

(i) Spheres

Unlike the tier 2 Tell Sabi Abyad objects, the collection of objects grouped into the "miscellaneous" or "other" shape category is divergent and cannot be further sub-divided neatly into categories of like objects. Of the rounded objects, both types of sphere (regular and flattened or semi-spheres) have a remarkable standardised range of dimensions and weights (as seen in plan view: both sub-types are perfectly rounded when viewed from above (figure 8.21). Yet size groupings: very small and then larger

sets of spheres within a limited and standardized size range are not present. Nor is this seen in any of the shape groupings within the Tell Sabi Abyad clay object assemblage.

(ii) Cones

Cone is a large and diverse category represented by 4 of the 5 sub-types. Conventional, straight sided cones with a round base are the most common (type 1 cones: n=21, 48.8% of cones). Straight sided cones with an oval base are also present, yet in much lower numbers (cones: n=6, 13.95% of cones). Cones with pinched sides (and a base of any shape) are the second most common cone type within the Tell Sabi Abyad assemblage at 15 (34.88%) (figure 8.22). The ratio of the minimum and maximum dimension of the cone base is regular and consistent within each sub-shape, yet the cones appear less standardized when contrasting their height and base size (figure A.F-13).

The cones are more diverse than 4 simple sub-types of shape, as seen in an examination of tip shape. 20 of the 32 cones with an intact tip (62.50%) have a sharp, pointed tip. This contrasts to the 4 cones (12.50% of intact cones) with a rounded tip and the 8 cones (25.00% of all compete cones) where the upper part of the cone shape is curved, yet not defined enough to be classified as having a rounded tip. The shape of the cone tip and the cone sub shape (as reflected by the base shape and by the straightness of the cone's sides) does not correlate. More than half of all type 1 cones (round base) display a sharply pointed tip, yet rounded and curved tips are also found within this sub-shape). Type 2 cones (oval base) have two distinct forms represented in equal numbers; half have a sharply pointed tip, the other half have a curved upper section. Lastly, three quarters of type 4 cones (pinched sides) have a sharp point at their tip; with even numbers of rounded tip and curved upper section examples (figure 8.23).

(iii) Discs

In contrast to the cones, the disc assemblage can be grouped into three sub-types, each comprising a distinctive set of objects. Type 1 (flat base) discs (n=27) are either round, oval or egg-shaped in plan view; with a completely flat base and a slightly convex top (table 8.8). Type 2 discs (n=40) are most commonly represented by objects which are again round, oval shaped or egg-shaped in plan view; with both sides being slightly convex. Rarer are the type 2 objects where both sides are completely flat (table 8.8). In most characteristics, other than shape detail, disc types 1 and 2 share very similar characteristics and have almost identical proportions of objects with and without specific feature including the presence of wear, pinching, markings, inclusions,

fingerprints and the type of clay (table 8.8). Plant markings covering one or both sides are common; present on 40.00% of type 1 (n=11) and 32.50% of type 2 (n=13) discs clay. The only features in which the two disc sub-types differ are in the surface finish and the coverage and distribution of markings. Type 1 discs have a far higher proportion (than overall and to the other types of discs) with a roughly finished outer surface (type1: 18.52%, type 2: 7.50%). The proportion of discs with markings is the same, yet the detail of those with markings differs across the two sub-types of disc.

(iv) Fragmentation

The tier 1 Tell Sabi Abyad objects display a higher degree of fragmentation than the tier 2 objects, attributable to the selection process of the tier 2 assemblage. More than half (61.09%, n=179) of the tier 1 objects are completely intact and a further 23.55% are described as being 75-99% complete – often with only small cracks or chips on the corners. Only 15.36% (n=45s) are damaged to the extent that less than 75% of the original object is now present, fewer than seen at the other two case study sites (<75% of original object surviving: Çatalhöyük: 18.02%, Boncuklu Höyük: 30.23%). The rounded objects have a higher proportion of complete objects. In contrast, cones; with pointed tips and sharp edges, were rarely recovered completely intact.

TIER 1: CRAFT

(i) Raw Material, Fabric & Finish

All but one of the tier 1 Tell Sabi Abyad objects is made from clay (0.34%), contrasting with the tier 2 collection where 6.00% of objects are stone. The single object of unidentified stone is similar to its clay counterparts in size: measuring 2.60 cm long by 0.90-1.00 cm wide. The overwhelming majority of clay objects appear to have been baked or intentionally hardened in some way; n=262, 89.42%. A range of techniques were used to initially shape the objects, all are simple techniques, utilising the hands and a flat surface (figure 8.24). 43 objects (14.68%) appear to have been applied to a flat or three-dimensional surface; suggested due to impression on one surface, and a concave curve within the shape. The shape of the objects is also distinctive as although a range of three-dimensional shapes are represented, more than half of the objects which were applied to others are discs (28 objects, 65.12%) (figure 8.25); disc-shaped objects would have been one of the easiest shapes to apply, and the result is a flat surface on at least one side. In most instances, the type of objects or surface the object was applied to is not definitive; however, matting or basketry and vessels have been identified.

Almost all of the clay objects (94.54%, n=277) display fine clay texture (figure 8.26, left), accordingly 208 objects (70.99%) have a smooth and a further 46 objects (15.70%) have a very smooth outer surface finish (figure 8.26, right). Almost all (81.82%) of the "coarse" clay textured objects having a "rough" outer surface finish. Despite the prevalence of objects displaying smoothly finished fine clay, the number of objects displaying visible fingerprints on their surface is low at only 6.14% (n=18). 6 of these objects have one clear print identifiable (33.33% of objects with fingerprints); whilst 3 objects (16.67% of objects with fingerprints) have 3 clear fingerprints present (figure 8.27).

(ii) Inclusions & Clay Colour

More than half of the assemblage has visible inclusions (n=168, 57.34%) with a higher presence of organic (38.91% of tier 1 objects) as opposed to mineral inclusions (60.41%) (table 8.9). The most commonly selected choice from the 16 pre-set colours and colour shades was "dark grey"; selected for just over one quarter of all objects. Three other shades were also common; "mid-grey" (n=66, 23.53%), "mid-brown" (n=62, 21.16%) and "black/very dark grey" (n=50, 17.06%). Assessment of the number of times each of the pre-set colours or shades were selected shows that darker shades were far more frequent than lighter shades (with the exception of "black") (figure 8.28).

(iii) Colour: Burnt Objects & Hardened Objects

Despite almost all of the tier 1 Tell Sabi Abyad objects being fired or baked, only a very small proportion; 5.46% appear to be "definitely", and 13.99% "possibly" (total: 19.56%, n=57). This suggests burning was not a result of the hardening process and possibly occurred post-deposition. This is supported by the location of the burning. The fired objects are darker overall than the unfired objects. The objects which contain "black" as a base colour (82, 27.99% of all objects) are almost entirely fired or baked (table 8.10).

TIER 1: DECORATION & AESTHETICAL ELABORATION

A relatively high proportion of tier 1 Tell Sabi Abyad objects have intentional, decorative markings; 38.23%. Of the 112 marked objects, a range of designs and techniques are present (applied with an instrument: 32.14%' impressed with an instrument: 35.71%, both: 4.46%, unclear: 23.21%) (figure 8.13). A significant proportion; 24 (21.45% of marked objects) objects have markings in the form of fingernail decoration, as seen on a number of the tier 2 Tell Sabi Abyad objects. A number of those with fingernail decoration are cone shaped with a fragmented top. Just under half of the marked objects had "very clear" markings (n=48) and the majority of marked objects have less than half

their overall surface covered; most commonly on the top and/or base surfaces – arguably the easiest places to decorate and the most immediately visible locations when the object was held in the palm or placed on a flat surface. Many different forms of markings from single lines, sets of parallel, crossing or zig zag or wavy lines, incised circles, dots, pronounced and seemingly intentional matting or basketry impressions and plant impressions (table 8.11). They appear alone or in combination, however, three styles dominate being found on 97.08% of the marked objects (table 8.12). For all three, around two thirds of designs appear alone and one third appear with other marking forms. There is no correlation between object colour and the presence and type of markings.

TIER 1: CHARACTERISTICS BY THREE-DIMENSIONAL SHAPE

(i) Markings

There are some objects characteristics which vary according to three-dimensional shape; suggesting that some groups of objects were distinct not only due to their shape, but also to their colour, markings, impressions, pinching, presence of depressions, baking/firing, burning and another characteristics features. Considering three-dimensional shapes represented by large sample numbers, some clear differences in quantities can be seen. More than half of all type 1 and 2 disc and type 4 cone have intentional markings (62.96%, 57.50% and 60.00% respectively). This contrasts with less than a quarter of spheres and one quarter of ovoids table 8.13. The presence of clear, bold markings could easily distinguish a plain disc from a marked disc for example, thus not all, but a significant proportion of a certain shape would need to have markings in order for this to have been a distinguishing feature and a way of grouping the objects aside from or in addition to their three-dimensional shape and as a way of classifying them. In this instance, visibility of the markings is of key importance. For marked objects within the type 1 disc shaped assemblage, a high proportion of them have extensive, highly visible markings covering 75-100% of the object's surface suggesting their presence was a way of further distinguishing discs by appearance (table 8.13).

The type of markings also varies according to three-dimensional shape. Shape assemblages with relatively low numbers of marked objects (such as spheres and cone type 1) tend to display only single, straight lines (type 1 markings) whilst shape collections with a high relative numbers of marked objects proportion of marked objects have a far wider range and combination of decorative markings and table 8.13 and figure 8.29). This suggests different types of markings were reserved for or preferred for different shaped objects. This could be for symbolic reasons or for ease of application.

Spheres are not commonly marked. Those with markings have a single notch or line one side only, covering only a small part of the object. In contrast, more than half of discs are marked.

Almost all of the tier 1 marked discs display distinctive plant impressions, interpreted as deliberate, and thus classified as "markings". These are found on the base, top or both, thus covering at least 50% of each object. Like the small number of Çatalhöyük objects interpreted as displaying intentional plant impressions, these Tell Sabi Abyad discs with a small number of discs are interpreted as having deliberate as opposed to incidental plant impressions (from manufacture, resulting from being crafted or dried on a plant based surface). Again, these objects display extremely deep, clear and extensive plant impressions, covering the entire surface of at least one, and often both sides. Furthermore, many are not flat, but curved, thus the presence of plant impressions covering at least one entire side of the disc would not be an inevitable aspect of manufacture (further supported by the presence of a larger number of discs lacking plant impressions). The fact that discs could easily be shaped and dried without deep plant impressions being transferred onto the object, covering an entire side, or both, indicates that these impressions were deliberately placed.

(ii) Fingerprints

Clay objects of a certain shape are also more likely than others to display visible fingerprints. Only two of the 70 spheres have visible fingerprints on their surface (2.86%). The count for flattened/semi spheres and cone type 1 is also very low (2.38% and 4.76% respectively), despite both having a reasonable sample size. In contrast, disc types 1 and 2, and type 4 cones all have high proportions of objects with fingerprints (14.81, 12.50, and 13.33%) (figure 8.30). These differences could be explained due to differing degrees of manual manipulation (as opposed to shaping an object on a flat surface) certain shapes require compared to others. Spheres for example were likely created by rolling clay in the palms and then leaving on a flat surface until dry. Thus fingerprints would rarely be created on the surface. In contrast, discs would be rolled in a similar fashion, into a ball, but then flattened by the palm onto either a flat surface, or between two palms, and the finger were used to them peel the disc from either the palm or surface in order to place in an area to harden.

TIER 1: NOTABLE OBJECTS

A number of the tier 1 Tell Sabi Abyad clay objects stand out from the rest. Some are

single objects which display, remarkable and unique features. Others share a set of unique features with a number of objects from the collection. They share a number of highly standardized features, cross-cutting or within a three-dimensional shape sub-type. This high degree of object uniformity makes these groups of objects notable amongst the general clay object assemblage at Tell Sabi Abyad.

(i) "Anthropomorphic Cones"

There are a total of 15 cones which can be grouped together. These "anthropomorphic cones" (figure 8.31) share a number of qualities making their overall appearance very distinctive and highly standardized, cross-cutting traditional cone sub-type shape boundaries(see table A.F-2 for morphological summary of each object). The objects are cone shaped at first glance. The base shape of the anthropomorphic cones varies, 60.00% are round in plan view (n=9). The plan view shape of the others includes square (n=1), oval (n=1) and egg-shaped (n=2), yet, all have a symmetrical and complete shape when viewed from above. The size of the base is wide in comparison to the rest of the object, giving the anthropomorphic cones a bottom heavy appearance. The uniformity of appearance is clear when contrasting the ratio of different dimensions of the group compared to that of all cones (figure A.F-13).

In size, the anthropomorphic cones are very consistent. The skill of craft is also excellent and uniform. All 15 objects are baked, made from fine clay and the overall surface is good, described as either "smooth" (n=7, 46.67% of all examples) or "very smooth" (n=8, 53.33%). Despite the high degree of finish many (n=9, 60.00%) show signs of heavy wear on the base and around the circumference of the object. The anthropomorphic cones appear to have been manipulated within the fingers only in order to craft them into their final shape. More than half (8, 53.33%) have a concave shaped base; the size and shape of a thumb imprint. Over half of the anthropomorphic cones have intentional decoration or markings (n=9, 60.00%), and many are found with unique and intricate decoration. Clay, shaped into tiny circles, each incised with a single (rarely double) short line across the centre (seen on n=7 or 46.67% of anthropomorphic cones) (figure 8.32). These are then applied to the object, most commonly in a circular fashion around the rim of the base of the object (seen on 5 examples). For CO#s272 and 273, rounded scars in the clay in a ring around the base are the only remaining traces of this decoration). A sixth anthropomorphic cone (CO#150) displays applied circles in a ring around the object near the base, in conjunction with other markings, and a 7th (CO#183) also displays applied circular pieces of clay, yet these differ in their arrangement (running vertically

down the front of the object) and detail (each tiny applied circle of clay is incised with two, parallel lines, rather than a single line). Though these objects do not display any overt human characteristics, and were recorded as they fulfilled the criteria of this study, upon closer inspection, they display a number of unique aspects, suggesting the anthropomorphic cones may be better thought of as figurines rather than geometric clay objects.

(ii) Large Discs with Impressions

A second group of noteworthy objects comes in the form of discs (type 1 and 2), 26 of which can be grouped together by shared distinctive characteristics (n=12 are type 1 discs, n=14 are type 2 discs. Figure 8.33). The crucial identifying feature of the group is the entire surface of one and often both sides covered in impressions (interpreted as deliberate, see "Tier 1 Markings" section above). 26 of the tier 1 Tell Sabi Abyad discs display this characteristic feature (37.14% of all tier 1 discs, 8.87% of tier 1 objects). These impressions appear to be intentional, however, they are not matting impressions (as seen for example in figure 8.25), but seemingly random; most likely dense plant impressions as if the disc was pressed onto a floor or work surface of grass, straw or other such plant material. The majority of discs with extensive plant (or unidentified) impressions (16, 61.54% of discs of this kind) display them on both surfaces, thus covering the entire object. In addition, these notable discs are generally slightly larger in size and weight than other discs. The 26 discs with dense impressions average 3.18 cm in length (diameter), ranging from 1.65 cm to 5.80 cm, whilst all type 1 and type 2 discs (n=67) average 3.03 cm, ranging from 0.95 cm to 5.70 cm.

These discs are often bent; they can be of type 1 (both base and top even-either flat or slightly convex) or type 2 (flat base, convex top), however, once the object has been shaped, it is then moved before the clay has hardened, resulting in a warping of the disc shape. Sometimes one or both sides is bent bends upwards or downwards, as if the object was peeled from a flat surface before the clay hardened and then left to dry in that position (figure 8.33, middle row). Other examples exhibit a "C" shape, as if the disc was applied to a curved object or surface, yet impressions are curiously found on both the outer and inner surface (figure 8.33, bottom row). This third characteristic is particularly striking, as it means the impressions on the surfaces must have been intentionally placed, and were not merely the result of the crafting of the objects on a textured surface. In addition, these notable discs are all baked and made of fine clay. 76.92% of identified examples (n=20) also have a smooth outer surface, making the plant and other

unidentified impressions more visible. The extensive nature of the impressions seen on these 26 objects, as well as their presence; on both the top and base, often on the convex surface and on the curved surfaces of warped discs makes this collection of discs distinct within the Sabi Abyad disc assemblage. The impressions appear to be intentional (rather than a consequence of craft), like other "markings" seen here and at other sites, thus they were likely applied at least as decorative element and likely to distinguish these discs from others – perhaps conveying meaning.

The distinctive nature of these larger, and "marked" discs may suggest a distinct function for the 26 objects. However they do not appear to be a type of sealing or "jar-stopper". Other clay artefacts within the wider Tell Sabi Abyad artefact assemblage fulfilled this role. Outside of the 393 recorded clay objects are a number of other object categories; "sealings", "jar-stoppers" and "pierced-discs" for example. The sealings and jar-stoppers (see for example figures 4.3-13 and 5.2 in Chapters 4.3 and 5) are almost identical, save for the presence of a stamp seal impression on the former. Both are clearly distinct from the studied clay object. They are generally far larger (when complete), most show clear signs of human manipulation in the presence of deep finger impressions, indicating they have been roughly shaped into a ball, and then pushed into position to seal a container (see for example figure 5.1, bottom right). The sealings and jar-stoppers are not formed into a recognisable shape of any kind, and are most commonly fragmented (where they have been deliberately broken in order to remove them from the container or package which they sealed). Therefore most of Tell Sabi Abyad's sealings and jar-stoppers are easily recognisable in form, and also in functional designation.

The "pierced discs" of Tell Sabi Abyad are also distinctive, again contrasting to the discs, and especially the "marked disc" collection. Like the sealings, they are generally larger than the recorded, disc-shaped clay objects (at least the size of the rim of a modern coffee mug). All are totally flat (rather than being "u" shaped, curved at one end, or irregular). They are uniformly circular in plan view (many of the recorded disc-shaped clay objects are oval or irregularly shaped in plan view), with a small, round hole in the centre. Almost of the pierced discs are well-crafted, made from re-used pot-sherds. Though the function of the pierced discs is not totally clear, they are interpreted as possibly acting as lids of smaller cups, bowls and other container types. In this context, the 26 larger clay discs with impressions discussed above do not appear to have also acted as a fourth type of sealing. The presence of deep plant impression on *both* the top and underside is not explained by this interpretation, not is the lack of any fingerprint, or finger-shaped

impression on any surface.

(iii) Geometrics with *Possible* Stamp Seal Impressions

Two further objects within the tier 1 Tell Sabi Abyad collection are outstanding due to the impression(s) found on them. CO#105 is a well- crafted type 2 (flat base) disc; intact aside from a small chip. It is round in plan view, with dimensions within the average disc range of 2.80 cm by 2.60 cm, with a thickness of 1.80 cm and circumference of 8.60 cm. CO#105 is baked from a fine, mid-brown coloured clay with few visible inclusions. The surface finish is very smooth. Both the top and base surfaces have a circular impression in the centre, which appears to be the result of a stamp seal (figure 8.34). The impression is clear and deep at a maximum of 0.15 cm (at the edge where the impression meets the main clay of the disc). The image on both sides is identical, yet the exact detail cannot be discerned.

CO#287 is similar as it also displays what at first looks like a stamp seal impression on the base. This object is semi-spherical in shape; object is completely intact and again well crafted. The diameter is 2.50 cm, with a circumference of 8.40 cm and thickness of 1.40 cm; thus in size it is very similar to CO#105. Likewise, CO#287 is baked and of a similar clay colour and finish to CO#105 (figure 8.35, top). The upper surface is smooth and curved (convex) contrasting to the flat, heavily worn base – displaying the impression; as such, the design is less clear. The outline of the impression is round, however this round shape does not frame an internal design, shape of the design itself creates an overall round edge to the impression with a diameter of 1.70 cm. At its deepest, the impression sits 0.15 cm below the main base surface. The design has three distinct, curved elements, leaving a small circular shape in the centre, where the clay retains the same height as the clay around the edges of the impression (figure 8.35, top). The two stamped objects are thus far unique in the Tell Sabi Abyad assemblage; no other geometrics with clear stamp seal impressions have been published, nor recovered. The presence of such intricate, seemingly stamped impression on two geometrics suggests a distinct function of these two remarkable objects compared to other clay objects from this site.

TIER 1 & 2 OBJECTS: MORPHOLOGICAL COMPARISON

The two tiers of Tell Sabi Abyad objects share many similarities overall. In contrast to the other case-study sites, the objects are more standardized, well-defined within each shape category and demonstrate a better degree of finish. Generally there are no singular

or sets of objects which appear in one tier and or the other. The exception to this rule is the presence of the published "miniature vessel, token" objects (CO#' 2883-2897). However, it is likely that other miniature, vessel-like objects could lie within the large unstudied objects stored in Syria. The two data sets also exhibit a number of differences. Some of these differences can be accounted for due to the differing nature of the two data sets and the way this data was assembled, others require a different explanation. As a whole, the tier 2 collection is far more refined, with few crudely formed objects; an obvious result of the selection of a relatively small sample of "nice" objects for publication, from a far larger group of more diverse (in terms of skill of craft, finish and definition of shape) geometric artefacts. Both data sets (tier 1 and 2) cover a wide range of shapes; dominated by spheres, and with significant proportions of flattened spheres. Though the published set is selective and not representative of the Tell Sabi Abyad assemblage as a whole, it is this tier 2 collection which shows more diversity with regards to three-dimensional shape, with all 16 of the pre-set shapes and sub-types represented. This suggests that although the proportions of different shapes present in the tier 2 assemblage may not be representative of the estimated >1,535 small geometric objects at the site, the range of shapes is, with perhaps the particularly rare and therefore more interesting shapes selected for publication.

The published (tier 2) collection has a significant number of "other" shaped objects, far higher proportionally than in tier 1 (38.23% and 9.00% respectively). The majority of these can be grouped into homogeneous "sets" of objects. The same cannot be said of the "other/miscellaneous" group of tier 1 objects; however, as illustrated in the "notable" section of the tier 1 discussion, a number of objects from this assemblage can be grouped into sets of homogenous characteristics-across shape sub-types; such as the anthropomorphic cones. Likewise, the published (tier 2) objects have a far higher proportion of objects which display intentional markings than the tier 1 set. Although the proportion of marked objects vary considerably, the type nature of the markings does not, with similar marking types found on objects across the two data sets; fingernail impressions for example (seen on CO#294: tier 1, and CO#s 2851, 2861 and 2862: tier 2) and the use of multiple, closely spaced incised dots on one surface (as seen on CO#226: tier 1 and CO#2912: tier 2 "game piece? Token").

Aside from the more commonly pre-set shapes, a number of more unique objects were recovered in both assemblages, again highlighting the similarity of the two data sets. Flat, two dimensional triangles are present in both sets (CO#s 187, 205 and 2881) and the

two objects with holes in the front face; the "game piece" and the decorated truncated cone with square base (CO#s 226 and 2912) are remarkably similar. Other objects found only in singular examples to date include; the notched cylindrical tally (CO#2911), the stone square base cone (CO#2879) and the stone cube (CO#2914). The two stamped objects (CO#s 105 and 287) as well as the second possible stamp seal (CO#2874), as well as the four bullae stand out as the more unique finds within the Tell Sabi Abyad assemblage.

8.3- CONTEXTUAL ANALYSIS

Overview of Sources

Like the morphology of the small geometric clay objects recorded from Tell Sabi Abyad, the context of the individually studied and recorded objects (tiers 1 and 2, n=393) is also subject to differing levels of detail and information, depending on the source of the contextual information (table 8.14 and figure 8.1). Aside from limitations due to the detail and type of contextual information held and the respective level of object descriptive information published, analysis of the context of the Tell Sabi Abyad objects was also limited to the nature of information retrieval. Of the 393 objects studied (at tier 1 and 2 levels), the overwhelming majority of them were excavated in the 2008 and 2009 excavation seasons; 102 and 173 objects respectively (which combined total 69.97% of all small geometrics clay objects studied from Tell Sabi Abyad). For most excavation seasons the number of objects studied is only a fraction of the total estimated number of small, clay geometric objects – as reflected by the electronic finds database – yet for the 2008 and 2009 seasons, the number of objects studied and the estimated total number of clay geometrics recovered is almost equal (see figure 8.36).

8.3(a) GEOGRAPHIC & TEMPORAL DISTRIBUTION

(i) Overview

The studied objects from Tell Sabi Abyad originate from five distinct excavation areas: operations I, II and III; all on the main tell and tells Sabi Abyad II and III (figure 8.37. Also see figures 4.3-2 and 4.3-3 in Chapter 4.3). The studied objects are not evenly distributed across these five excavation areas, with over two thirds of them coming from operation III of the main tell. Within each site area the period and duration of occupation varies and an increased density of clay objects can be seen within some levels of some studied areas of the site

(ii) Cultural Phase

A large proportion (n=377 or 95.93%) of the studied objects can be equated to a specific or broader cultural phase. Considering objects from all excavation areas combined, eight sequential cultural phases are represented – continuously from the PPNB (Verhoeven & Akkermans 2000: 1, table 2.1 p. 7) into the Early Halaf period c. 5,900-5,800 cal. BC (table 8.15). Overall, a huge proportion of the studied geometric objects derive from the Late (ceramic) Neolithic phases of occupation at Tell Sabi Abyad (n=367, 93.38%) compared to just 10 objects (2.54%) from the PPNB. Unfortunately, the majority of operation III objects (82.55%) cannot be attributed to a specific phase within the broader Late Neolithic time period of 6,900-5,700 cal. BC, and these make up the bulk of objects from the Late Neolithic phases. Looking more closely at the specific cultural phases of occupation (data available for only n=150), a more compelling picture emerges, with clear differentiation in the temporal distribution of objects within the Later Neolithic, with n=69, more than half (63.89%) of all objects where specific phase was available coming from a single phase: the "Transitional" Halaf period c. 6,000 cal. BC (table 8.15).

(iii) Phase by Area of Site

- ***Sabi Abyad II***

Sabi Abyad II is one of the older occupation areas, occupied from c. 7,550 cal. BC in the PPNB period (Levels 8-2), into the Pottery Neolithic period (commencing c. 6,850 cal. BC, Levels 2 and 1 (table 4.3-1, Chapter 4.3) (Nieuwenhuyse, Akkermans & van der Plicht 2010: fig. 3 p. 76). The oldest object studied is represented by level 7 of Tell II. Almost all studied objects come from the PPNB phase of settlement (c. 6,700-6,300 cal. BC); 90% of the area's studied object total (table 8.16). This patterning seems to represent the overall picture, as almost all of the n=19 published (as "tokens") tier 3 level clay objects (Verhoeven & Akkermans 2000: fig. 4.2 p. 92) from this mound also come from the PPNB phase (84.47%).

- ***Tell Sabi Abyad-Operation I***

This patterning is still interesting if compared to operation I. Here occupation spans the latter part of the Early Pottery Neolithic (c. 6,700-6,300 cal. BC) into the start of the Middle Halaf c. 5,700 cal. BC, with the youngest of all studied objects coming from level 3 of operation I (approximately 5,900 cal. BC (table 4.3-1, Chapter 4.3) (Nieuwenhuyse, Akkermans & van der Plicht 2010: fig. 3 p. 76). Rather than clay objects being distributed across all phases of occupation they cluster primarily in one phase; the Transitional (into the Halaf) period (n=69, 80.23% see table 8.16 and figure 8.38). The published tier 3 data

of operation I supports this pattern, with 182 of the 197 operation I clay objects (published at tier 3 level) also coming from the Transitional Halaf phase (Akkermans 1996b: table 8.1 p. 442, pp. 441-43, Verhoeven 1999: 40). This trend is stark, yet unpublished tier 3 data hints that only a fraction of the small geometrics recovered in the 1988-93 seasons (when operation I was under excavation) have been published and therefore studied (table 8.17). It is possible that this bias in phase at operation I is due to the bias in the objects selected for publication.

(iv) STRATIGRAPHIC LEVEL BY AREA OF SITE

Although data is limited (the stratigraphic level from which clay objects were retrieved is available for only 2 recorded objects from Sabi Abyad III, 4 clay objects from operation II and 17.45% of operation III's recorded clay objects), the findings do suggests that across Tell Sabi Abyad, clay objects are more prevalent in certain stratigraphic levels of occupation than others (figure 8.39). The operation III objects (n=45 have a level recorded) are found mainly in two occupation levels; level B-8 dating to the start of the Pre-Halaf period (approximately 6,200 cal. BC, 29.17%) and level A-4 in the mid to late Early Pottery Neolithic phase (c. 6,400 cal. BC, 33.33%) (figure 8.39b). Notably, three quarters of the studied objects from operation II (n=4) come from a single occupation level; level 5 (figure 8.39, top). However, this is a small sample size and represents only 4 objects from the total of 57 clay objects recovered from this operation (see later in this chapter for discussion of the distribution of clay objects and other artefacts within operation II). In contrast, the stratigraphic level is available for all 10 clay objects recorded from Sabi Abyad II (n=10). On this tell, Levels 8-2 cover the PPNB, with only level 1 dated to the Pottery Neolithic period – the final and youngest level (see chronological table, Chapter 4.3 table 4.3-1). Only one clay object comes from the Pottery Neolithic level 1; half (50.00%) come from level 5, and a further 40.00% come from level 3 (figure 8.39, bottom).

The sample size for operation I is larger (n=86) and the level is known for 100% of recorded clay objects. At operation I, the grouping of clay objects by stratigraphic is most clear; three quarters of studied clay objects come from a single phase of occupation; the Transitional Halaf. This phase of occupation at operation I is represented by Levels 7 to 4, however, all geometrics recorded form operation I (at both tier 1 and 2) cluster in only the central level of this phase, level 6 (the "Burnt Village") dating to c. 6,000 cal. BC (n=67, 77.91% of all studied objects of operation I) (figure 5.2-5b) (Akkermans 1996b: table 8.1 p. 442, pp. 441-43, Verhoeven 1999: 40). A further 12 operation I geometrics come from

level 3 (Early Halaf, 13.95% of studied operation I objects.). All other levels contain just 3 clay objects or less. This patterning is striking and supported by the published tier 3 data, in which of the total of 197 objects discussed, even a larger proportion, 92.39% (n=182) come from level 6 (table 8.17 and figure 8.40). Whether or not there are different types of clay objects found in different periods of occupation within a single area (operation or tell) of settlement is discussed in section 8.2d below.

(v) HORIZONTAL DISTRIBUTION

Perhaps a more reliable way to ascertain if there is a real difference in the distribution of small geometric clay objects at Tell Sabi Abyad is to look at the number of objects recovered from each excavation square, within each site area comparing the number and proportion within each. Assuming all objects recovered from that excavation square have been studied and recorded in the *Clay Object Database*, a real picture of the relative geographic closeness, and horizontal distribution of objects in discrete areas of the site should be revealed. Operation II exists as only one excavation square, however, larger site areas do reveal the grouping of geometric objects within certain $10m^2$ excavation squares (table 8.18). In operation I for example, 30.23% (n=26) of the areas total object count (n=86) come from one square: Q12. Operation III sees a similar patterning with over 40% of the operations 275 recorded clay objects found in just 4 of the 28 excavation squares (F4: 9.09%, H4 I4: 10.55%, J4N: 13.82% and K3S: 11.64%). At Tell Sabi Abyad III, more than half of the area's 18 objects come from just two excavation squares; J7 (27.8%) and J9 (22.2%) (table 8.18 and figure 8.41). This, with the phasing and level data above, shows that certain areas of Tell Sabi Abyad certainly do see the clustering of small geometric clay objects within certain discrete spatial locations, suggesting that an analysis of the nature of these contexts could reveal what the inhabitants we doing in these area, and perhaps the function, or at least the use areas, of the small geometric clay objects.

8.3(b) NATURE OF CONTEXT

As the recorded objects are only from selected excavation seasons and areas of site (tells and operations), before the nature of the context from which small geometric clay objects was studied in detail, a basic survey of the features, buildings, open spaces and other characteristics of all levels within the studied excavation areas was carried out. This established whether the sample of n=393 objects came from contexts representative of the site as a whole. This survey confirmed that the 393 studied objects derived from a representative range of context types. Unlike the other case study sites, the distribution

of objects within the Tell Sabi Abyad assemblage does suggest that small geometric clay objects are more common in certain types of context than others.

(i) Basic Context*: Fill or Structural*

The overwhelming majority of recorded objects are recovered from "fill"; 291 objects (74.05%) compared to just n=8 (2.04%) coming from "building" or "structural" material. There is much variability by site area, as to whether or not this information on was available, yet there was no variability by site area, in the proportion of objects found in fill as opposed to building material. A wide range of type of fill are represented by the "fill" objects (n=291/74.05%) range – yet general "ashy fill layers/horizons" and "other" fill types dominate (n=61, 15.52% and n=75, 19.08% % of all recorded objects respectively; figure 8.42). Hearth (n=27, 6.87%), room (n=33, 8.40%) and pit (n=30, 7.63%) are among the more common fill types to contain geometric clay objects. Oven (3.311) and burial/grave (0.51%) fill objects are amongst the rarest (figure 8.42 and table 8.19).

The large number of variables for fill type means that the proportion of objects found in different fill types varies significantly from area to area, many records record a combination of different fill types as the exact type of fill was not always 100% clear. However, if only select (the less variable, more simple and specific, i.e. building vs. open area) fill types across site areas are considered for the areas with larger sample sizes (Sabi Abyad III: n=232 certain records and operation III: n=11 certain records), clear differences can be seen in the two records (figure 8.43). 5.56% of Sabi Abyad III's objects come from grave/burial fill (notably the large area within square J7 which contained the feature labelled as the "Death pit" whilst only 0.36% of operation III's geometrics come from this type of fill for example. A large proportion (26.91%) of operation III's objects come from "other/general fill material" whilst only 5.56% of Sabi Abyad III's objects come from this fill type (figure 8.43).

(ii) Location of Context

Regardless of whether the geometrics objects come from fill or structural material, and the nature of that fill or structural material, almost two thirds of them come from a context located in an open or external area; 64.63% of all studied objects (n=254), compared to 30.79% coming from an internal or covered space (n=121) (table 8.20). This contextual data does not immediately support the functional interpretation of the majority of Tell Sabi Abyad's small geometric clay objects being used for administration.

Possibly only some were, with the majority, the 64.63% recovered from external areas being used to perform a different function. Perhaps they were first archived, whilst a transaction was in progress, or for a period of time after initial use in the counting or recording of commodities and then tossed away at the end of life. This could explain why the majority come from open areas whilst some are found in internal spaces. Yet as discussed in Chapter 5 (5.6a), in a Neolithic setting, administration may have been carried out in an open/external space, with archives not necessarily only being placed within buildings. The more important, indicative feature of an administrative context is the presence of groups of clay objects deliberately placed together, in a discrete location, stored for future reference. Considering the actual type location (recorded under *Location of Context*), "open area" is the most common; 57.00% of all studied objects come from a context described as an open area (n=224) (figures 9.44 and 9.45). "Rectilinear building" is the second most common context location, yet this is represented by far fewer objects, n=69 (17.56%) (figures 9.44, 9.45 and table 8.20). Tholoi constitute just 5% of all internal contexts (n=6 objects come from Tholoi, while the rectangular shaped "tripartite" and "T-shaped" buildings combined are location of an additional 5 objects (table 8.20and figure 8.45).

(iii) Nature of Context: *Contexts in an External Space*

The data can be divided further to study the detail of the nature of the object location within each specific type of external or internally located context (more relevant for n=121 internal rather than the n=254 external spaces). 175 objects come simply from an "open area" with no features or details to further describe the object's location (44.53% of all studied objects, 68.90% of all objects from an external space (table 8.21). 8 come from a context where the excavation square is dominated by an open air courtyard/platform (3.15% of objects from external spaces) and 28 from a courtyard clearly located within an open area (11.02% of objects from external spaces). Just 8 objects (3.15% of external area objects) were recovered from an oven within an open area, 2 between buildings, 3 between closely spaced buildings ("passage") and 1 from a pit (table 8.21). The nature of the context of the externally located objects suggests that these objects were likely thrown away, at the end of their useful life, into large open spaces between buildings – which were largely open activity and refuge areas. Those records where the sediment nature is recorded supports this interpretation, and the "open area-pit fill" and "open area-open burial area" contexts are recorded as containing bone fragments, pot sherds and general debris (external contexts have no sediment type record however).

(iv) Nature of Context: *Contexts in an Internal Space*

Almost all objects from internal spaces come from a room within a building (n=113, 28.75% of internal space objects) and more than half of objects from internal spaces, 57.02% come from a room within a "rectilinear building" (n=69, 17.56% of all studied objects: table 8.21). Very few objects from internal context types are buildings are not found in an open space within a room. Just 1 object was recovered from a doorway within a building and 1 from an internal courtyard. 4 objects came from a wall within a building, or room of a building (3.31% of all internal space objects) and 2 came from ovens (1 from an oven within a room and 1 from an oven within a building of unspecified function/shape; table 8.21). Despite the abundance of internal space objects hailing from "rooms", very few were recovered *in situ* on the floor of a room (n=2, 0.51% of all objects) with most being recovered from room fill.

(v) Context Type*: By Site Area*

The patterning seen above in context type shows significant changes, when considering separately by site area, reflecting the differing nature of the areas exposed across the site. The bias in the concentration of objects from external as opposed to internal areas varies significantly. In operation I for example, 75 objects come from internal contexts compared to only 8 from external contexts table 8.21. This area is dense in architecture; however, there are also plenty of open spaces between buildings and around the edge of the village. Interestingly, 80.73% of objects from operation III (n=222) come from externally located contexts, despite the fact the density of structures and ratio of buildings to open spaces within this operation is similar to that of operation I (table 8.21 and figures 4.3-3, Chapter 4.3). Also, a wide horizontal exposure has been revealed by work in this operation, unlike in operation II, where only one square (V6) has been excavated and the operation is dominated therefore by the building which covers most of this square (accordingly, all artefacts recovered come from inside this building, see later in this chapter).

This comparison between operations I and III suggests there is a real difference in the use or disposal of small geometric clay objects across different areas of the site. Perhaps the inhabitants of the operation III village did not archive or store their geometrics at all, but simply discarded them by throwing them into open area at the end of their life. If so, perhaps this was because geometrics had a different function, meaning or significance within this village, acting as simple counters with no imbued deeper meaning or value? Or they could have been used as gaming pieces which were again easily crafted and then

disposed of once used for a period of play. Or perhaps the inhabitants did use geometrics as clay objects-to carry out and perhaps record transactions, but the part of the village revealed in the exposure of this operation was simply not used for this purpose?

8.3(c) ASSOCIATED OBJECTS

(i) Overview

The final aspect of analysis of the archaeological context of Tell Sabi Abyad's small geometric clay objects is a study of the presence or absence of other artefacts found with the geometric object in question, where information could be obtained. For both direct and indirect association objects; their presence or absence, number and nature was recorded. Objects found with two or more additional artefacts in direct association were classified as being located in a "cluster".

(ii) Basic Patterning

More than half of all studied artefacts were recovered alone, n=213 (61.74% of the n=345 studied objects with available data). Yet a substantial proportion, 38.26% were recovered with at least one other artefact in direct association (n=132). Of these, more than three quarters, 79.44% of studied geometrics with ≥ 1 other artefact(s) in direct association (n=105) were recovered in a cluster, with only 25.71% of them found with only 1 additional artefact (n=27) (figure 8.46). This means that overall, 7.83% of the 393 studied artefacts were recovered from a cluster context.

(iii) Context Variability by Associated Object Presence

The geometric clay objects recovered alone (n=213) are found mainly in external spaces (n=179). This mirrors the picture seen when assessing context location of all objects across all excavation areas, yet a greater proportion of lone geometrics (84.04%) compared to all geometrics (63.63%) come from contexts in external spaces (figure 8.47). This increases the evidence that objects found in external context represent objects disposed of, rather than carefully and intentionally placed for later use. If the basic context location (internal or external space) of cluster is compared to single, this model is heightened. The majority of cluster objects come from internal contexts (69.52%, n=73), with a mere 27.62% (n=29) found in external spaces (figure 8.47).

(iv) "Clusters"

-Area of Site

The distribution of cluster objects according to area of the site is also telling. They are found predominantly in operation I of the main tell (57.14% of cluster objects), despite the fact that this excavation area contains only 21.88% of all studied objects (figure 8.48 and table 8.22). Within operation I, a mere 1.16% of studied objects were recovered as single, lone artefact. In contrast, operation III (total n=275) holds a smaller amount of cluster objects proportionally. With only 40 cluster objects coming from this operation, more than two thirds of objects within operation III were recovered alone (72.73%) (figure 8.48 and table 8.22). This again hints at the different nature of activities carried out with the excavated sectors of Tell Sabi Abyad as a whole, or alternatively may suggest a different use of small geometric clay objects by inhabitants across different areas of the site.

-Phase of Occupation

The majority of "cluster" objects mainly come from a single and short occupational phase: the "Transitional (into Halaf)" phase (n=60, 57.14% of cluster objects). The second largest proportion of cluster objects come from unspecified phases within the broad Late Neolithic (n=25, 23.81% of cluster objects). Aside from the Transitional Halaf, only two other specific phases of sentiment are represented by cluster objects, both in far smaller proportions; 10.48% of cluster objects (n=11) are found in the Pre-Halaf phase, and a further 7.62% (n=8) are from the Early Pottery Neolithic (figure 8.49). Compared to the distribution of studied objects by phase (across the entire site), there is a real concentration of "cluster" objects in one distinct phase in time from 6,700-6,000 cal. BC.

Analysis of the distribution of cluster objects according to their exact level within each area of site narrows down this time frame even further. All Transitional Halaf cluster objects (n=60) are found in operation I of the main tell (level 6 c. 6,000 cal. BC). As only a total of n=69 objects (regardless of cluster status) have been studied from this area, a huge 86.96% of all studied objects from this phase were recovered as a cluster. The remaining phased cluster objects all come from operation III. Those from the Early Pottery Neolithic come from levels dating to the end of the phase (Levels A-4/A-3) c. 6,450-6,350 cal. BC. Those from the Pre-Halaf date to the start of the phase (level B-8) c. 6,200 cal. BC. This gives an overall time span for the cluster objects as c. 6,450-6,000 cal. BC.

- Nature of Context

Consideration of the nature of the cluster objects coming from internal spaces (n=73) reveals a pattern which differs from the overall trend. Almost all come from rooms within buildings (n=71, 11 are from room fill, 60 have no further information) with just two cluster geometrics coming from walls (within buildings). Like all objects from internal spaces, the cluster objects found internally are likely to mainly come from room fill (Akkermans & Verhoeven 1995 report the majority of "tokens" in operation I level 6 came from general room fill up to ceiling height-possibly indicating them being stacked on shelves; such as in room 6 of building 5, pp. 16-17), with a lesser number excavated as *in situ* deposits recovered directly from room floors as the published information suggests (clay objects recovered with *in situ* deposits on the floors and just above the floor surface within rooms are published as being found specifically in room 7 of rectilinear building 5 within the operation I "Burnt Village" (Akkermans & Verhoeven 1995: 8, 16). Though if the objects were stacked on shelves, being preserved *in situ* within the burnt rooms of level 6, surely when the destructive fire took hold, the shelves would have been destroyed, resulting in a cluster of clay objects (and other items housed on the shelves) directly on or close to the floor surface of the rooms, covered by debris, roofing material and general room in-fill? Perhaps then, if the clay objects truly were recovered in all levels of room-fill, up to rom height, this indicates an intentional dumping of refuse into the rooms, which included clay objects (similar to the midden context of clay objects from Boncuklu Höyük and Çatalhöyük, see Chapters 6 and 7).

Cluster objects do not seem to be differentiated in buildings according to shape or type. Comparing the distribution of objects across tholoi, rectangular ("rectilinear and "tripartite") and "T"-shaped buildings, similar numbers of cluster compared to all objects are found within each (figure 8.50, top). This is because the objects from within these buildings tend to be cluster objects. Of the percentage of "all studied objects" is compared to the percentage of "cluster objects" found within rectangular buildings is compared the figures differ greatly (17.81% and 55.24%), as the majority of all objects come from external spaces, whereas the majority of cluster objects come from buildings (figure 8.50, bottom).

-ASSOCIATED OBJECTS: ***Nature & Number***

For those geometrics recovered with one additional artefact, the object is overwhelmingly represented by another "token" as seen in 24 of the 27 instances (2 objects are found with objects recorded as "unclear" and 1 with a bone awl). The cluster

objects are likely to have at least 1 additional "token" as part of their cluster (n=41, 39.05% of cluster objects). For those examples where the number of additional "tokens" is available, small geometric clay objects recovered from clusters which contain an additional "token"(s) most likely contain 1 or 2 more clay objects (figure 8.51)**.** This suggests that only low numbers of clay objects are being intentionally deposited in groups together. However, in terms of secondary associations, the data suggests that most clay objects from buildings came from a room where a number of other clay objects were also found in indirect association (table 8.23).

Though most clusters contain low numbers of clay objects, when geometric objects are recovered as part of a cluster of artefacts, they often form just one of "many hundreds" of objects (n=52/49.52% cluster objects studied). As most are recorded from publications, the exact number and break down of additional artefacts is not available (figure 8.52). The nature of the artefacts deposited with geometric clay objects is wide ranging, covering tools, jewellery and items of adornment, and utilitarian items. Examples recorded from publications include: a "concentration of various objects, such as figurines, clay objects, miniature jars and discs" within room 11 of the level 3 (Early Halaf) building I, operation I (Akkermans 1996b: 375). Similarly, the clay objects from level 6 (Transitional Halaf) of operation I are reported as mainly being found in clusters of objects. Room 6 of building II was found full of objects; aside from many "small tokens", ceramics, stone bowls, axes, bone implements/tools, labrets, clay figurines and more than 150 clay sealings were all recovered (Akkermans 1996b: 441; Akkermans & Verhoeven 1995: 12-13). Building V contained similar assemblages in rooms 6 and 7 (Akkermans 1996b: 441; Akkermans & Verhoeven 1995: 13, 15). See table 8.24 for "cluster" examples from tier 1 data sets.

-ASSOCIATED OBJECTS: ***Summary***

There are clear trends in the distribution of objects recovered with at least one other artefact, as opposed to those found alone in their context. Small geometric clay objects are most likely to be recovered as a single, lone object, however, when this is not the case they tend to be found in large groups and when they are deposited within only one other object, this tends to be a "token" rather than any other type of find. Geometrics from clusters are still fairly frequent, and these cluster objects are found most often with huge numbers of additional artefacts, from a range of functional categories, yet certain objects such as sealings (and jar stoppers), as well as pierced discs, figurines and labrets feature most commonly in these clusters. The location of clusters is also informative; they most

often come from rooms within buildings, especially the larger clusters; all of which come from the fill of a room. This does show they were stored together and thus likely had the functional use; this could have been as individual items, yet is more likely that they were used together as a group of artefacts such as counters.

Though these trends are indisputable, caution needs to be taken in terms of the interpretation of these clusters. Their presence and concentration within rooms of buildings may be in part due to excavation methods. With neither sieving nor flotation being consistently carried out at Tell Sabi Abyad (Chapter 4.3), it is likely that (even unconsciously) excavation of room fill has been more meticulous than the excavation of open spaces, especially those with no features and heavy in inclusions such as pebbles and small fragments of pottery and bone. This could account for the large number of objects retrieved together in clusters (where if excavated from an open space, some or all of the small artefacts in a cluster may have been missed) as well as for the existence of far more cluster in rooms compared to open spaces.

8.2(d) OBJECT MORPHOLOGY BY SITE AREA

Due to the nature of the recoding of the Tell Sabi Abyad objects, the full range of recorded morphological characteristics is only available for the tier 1 objects. The morphological record of the tier 2 objects differs in the nature and amount of detail available. Therefore, in order to explore the different nature of the appearance of all studied objects according to various aspects of an object's context, the only variable available for all recorded objects: three-dimensional shape will be used.

(i) Area of Site

There is a clear diversity in the proportion of objects of the different three-dimensional shapes distributed by different areas of the site. If we exclude areas with very small sample numbers (operation II, where only 4 objects of a total of 57 "tokens" have been studied) this is made clearer. Overall, spheres dominate as the most common shape (24.68% of all objects, yet) dividing the data into site area, spheres do not remain the most common shape in all areas of the site. Sabi Abyad III's assemblage is instead characterised by type 2 discs, 38.89% of the area's total count (figure 8.53). In operation I, "other/miscellaneous" is the most common shape; 24.42% of the area's total, compared to constituting just 12.21% of all studied objects (figure 8.53).

(ii) Phase of Occupation

Taking the four most common shapes overall (spheres, flattened/semi-spheres, type 2 discs and "other/miscellaneous"; combined total n=241), their proportional distribution across different phases of the site's occupation can again be compared to the overall patterning of the distribution of al studied objects by phase. Again, there is a clear change in the distribution of objects of certain shapes. However, many phases have very low sample sizes meaning that only the differing proportion of the most common three-dimensional shapes can be compared by phase (figure 8.54).

(iii) Location of Context

The location of context of the studied objects does not vary significantly when the proportion of objects recovered from an internal space are compared to an external space, according to three-dimensional shape (the four most common three-dimensional shapes are considered). Overall, just under one third of all objects come from an internal space (30.79%). This proportion remains similar for spheres (32.99% of all studied spheres) and flattened/semi-spheres (28.00%). The proportion of type 2 discs recovered from contexts in an internal area is less than overall, only 8.25%, whilst for the "other" category, objects are distributed in contexts within internal and external areas in far more equal proportions (46.81% internal, 53.19% external) (figure 8.55).

(iv) Case-Study Area: Clay Object Diversity at Operation I

The distribution of objects according to three-dimensional shape within operation I of the main tell (n=86) compared to all studied objects combined (n-393) shows little diversity (figure 8.56a, top chart). The residents of operation I, and the level 6 Burnt Village within it (where n=69 operation I recorded objects come from), were not using a select or restricted range of clay objects, but the full diversity of three-dimensional shapes seen at other phases and areas of Tell Sabi Abyad's occupation. However, a closer look at the distribution of clay objects within this area, according to proportion, shape, level, and nature of context shows some clear patterning indication the use of specific objects within specific areas.

-*Shape by Nature of Context, operation I*

A study of the distribution of clay objects according to three specific context types: tholoi, rectilinear building or all external space (covering 83 of operation I's 86 studied objects) show a clear differential concentration of clay objects within rectilinear-shaped buildings. Furthermore, when grouped by three-dimensional shape, some differences

can be seen in the location of objects of certain shapes across these three context (figure 8.56a top chart, column 2 compared to columns 3 to 5). This trend is clearer when plotting the distribution of the four most common shapes only (figure 8.56a, bottom chart). "Other" shaped objects form a significant proportion, nearly one quarter, of operation I's assemblage (n=21, 24.42% of operation I objects, far more than for all clay objects combined, figure 8.56a, top) and looking at the contextual distribution of them within operation I, they are completely absent from the tholoi (figure 8.56a). Rather than constituting a random selection of other and miscellaneous-shaped clay objects, 13 of the 21 (61.9%) "other" shaped clay objects within operation I are "miniature vessel, tokens", and all 13 of them come from rectilinear buildings within operation ,constituting 76.47% of the "other" shaped objects from operation I's rectilinear buildings. None of the 3 "other" shaped objects from open areas within operation I are miniature vessels, clearly pointing to the specific selection of certain-shaped clay objects to be deposited inside the rectilinear buildings of operation I.

The tholoi clay objects assemblage comprises a far more restricted range of three-dimensional shapes compared to those from rectilinear buildings (figure 8.56a, top). Notably, the tholoi do not contain any "other" shapes, whilst these dominate within operation I as a whole and are the most common shape within both rectilinear buildings (24.64% of all objects found in a contexts within a rectilinear building) and contexts from external spaces (37.5%) (figure 8.56a). In contrast, half of all tholoi objects are spherical in shape – spheres constitute around one quarter of objects in rectilinear buildings (23.19%) and none are found in external areas. The other tholoi clay object shapes are flattened/semi-sphere, cone type 1 and cone type 4 (n=1 of each). Of operation I's 21 "other" shaped objects, 17 come from contexts in rectilinear buildings. All of these are found within a room of a building, with all but two coming from just two rooms (n=7 are from room 11 of building I, n=7 are from room 6, building II, see table 8.25). None are found in tholoi. The "other" shaped objects from operation I are not a random mix of object shapes, 13 of them are miniature vessel-shaped clay objects, 11 of which come from just two specific rooms over two buildings (see below and table.27).

-Shape by Level of Occupation, Operation I

Analysis was also undertaken looking at the range and diversity of shape within level 6 of operation I (n=67) compared to all other levels within the same operation (a total of 19 clay objects objects). Diversity is again apparent; a far greater range of three=-dimensional shapes are present within the level 6 assemblage than all other levels within

operation I combined (figure 8.56). Though a far greater number of objects come from level 6, the increased range in shape within level 6 only appears to be real (figure 8.56, bottom chart). This is because operation I objects from levels excluding level 6 do not follow the proportional patterning seen for all Tell Sabi Abyad objects combined, but are overwhelmingly dominated by "other" shaped objects (57.89%, compared to constituting just 12.21% of the total Tell Sabi Abyad assemblage) (figure 8.56b, top). The level 6 set is far more mixed and evenly proportioned. Though dominated by spheres (26.87%,), flattened/semi-spheres and flattened/semi-ovoids are both common (each 14.93% of the level 6 set) and 3 other shapes, type 1 cones, cylinders and type 2 discs are also a significant part of the level 6 assemblage (each constituting 7.46%, figure 8.56b, top).

-Summary

There is differential distribution of clay objects according to both the number and shape of clay objects by context type and level of occupation at operation I. The trends seen in the presence, form and location of small geometric clay objects within operation I is evidence in support of the notion of a different use and therefore storage and/or disposal of these items according to their appearance, and a specific use of them within certain areas and levels of the site. Clay objects are found in all levels and context types within operation I, yet certain shapes (such as the miniature vessels) are present in certain levels (3A and 6, see "miniature vessel" section below") or context types only. The concentration of clay objects in one particular level (level 6) of operation I, combined with the specific range and proportion of shapes present within this level, and specifically the rectilinear buildings within it is indicative of a specific use of a set combination of clay objects, in a certain location and period in time.

The concentration of certain types of clay objects within level 6's rectilinear buildings is clear evidence of a developed system of clay objects use within this period at operation I. Clearly the clay objects were deposited within the small square rooms of the rectilinear buildings at Tell Sabi Abyad. Most of these rooms are small (around $1m^2$) and therefore assumed to be storage units, although some buildings do contain far larger rooms (see figure 4.2-16 for level 6 plan), and the concentration of lay objects in specific rooms within them suggests they were archived. This retention of clay objects indicates a use not only in counting, but in information storage, being kept in order to be referred back to at a later stage in time.

The reduced number of clay objects found in tholoi is marked, even considering the reduced number of tholoi compared to rectilinear buildings, and their far smaller size compared to their rectilinear counterparts with the Burnt Village. The internal layout of the tholoi varies, some have no internal division (Building VII) whilst others are divided into a number of small compartments (i.e. Building VI) like most of the rectilinear buildings (Building II for example) and others (building IX) have one larger room, with a small (less than $1m^2$) internal compartment within it (Building IX). Either way, the tholoi measure no larger than 6-7m in diameter, meaning those within internal sub-divisions comprise compartments larger than the presumed storage units of the rectilinear buildings, yet smaller than the larger rooms of the rectilinear buildings (see plan figure 4.3-16). This combined within the reduced number of clay objects found in tholoi, and the restricted range of shapes represented by the tholoi-based clay objects all combine to suggest different activities were carried out in the tholoi of level 6. The use of clay objects was limited in tholoi, perhaps to activities not involving the counting, accounting or storage of goods or records of them. Despite the good level of analysis enabled by the evidence from Tell Sabi Abyad, it evidence and analysis, it must be remembered that although a large number of objects from one level within one operation at Tell Sabi Abyad are represented in the operation I assemblage, the studied object count is just a proportion of the 197 objects recovered in total from this area.

8.3(e) CONTEXT OF *NOTABLE* OBJECTS

Analysis of the small geometric clay objects at Tell Sabi Abyad has revealed the presence of a number of distinctive objects (individual and groups) as detailed at the end of section 1 above. Here, the distribution of these objects across various temporal and geographical spheres of the site, as well as a study of the specific nature of their deposition; might reveal whether they were treated differently or disposed of in a particular way. This mirrors the distinctive appearance of these items, reflecting a special or distinctive function and meaning can be attached to these selected objects.

(i) Single Objects

-Cube, Incised Cylinder & Decorated Cuboid

The cube (CO#2914), incised cylinder or "tally" (CO 2911) and the decorated cuboid ("gaming piece" CO#2912) as introduced in section 1 above (see figures 9.6, 9.15 and 9.16) are all unique and distinctive objects at Tell Sabi Abyad, however, little about their context reflects this. All three come from the oldest levels of occupation – Sabi Abyad II. The cube and cuboid (CO#s 2912 and 2914) both come from the PPNB (c. 7,550-7,000

cal. BC.). The incised cylinder has a broader time frame, belonging to either the PPNB or the Early Pottery Neolithic phases (c. 7,550-6,300 cal. BC). The so-called "gaming-piece" was recovered from an open area; apparently as a result of being disposed of after use or lost, whilst the cube came from a room within a building (room 2, building III), where it was recovered with "many" other artefacts. The context of the cube is reminiscent of the context of many of the cluster clay objects, especially those from within operation I's Burnt Village. Yet as the sole example of an object of this shape at Tell Sabi Abyad, its role in counting, accounting and administration (as suggest for the clay objects of the Burnt Village) is intriguing.

(ii) Groups

-Stamped Geometrics: CO#s 105 & 287

The context of the two stamped geometrics (see figures 9.34 and 9.35, top) reveals nothing telling about their function. The context of both suggests that like the majority of studied geometrics, they were simply thrown away once no longer needed and their value lost. Both date to the Late (ceramic) Neolithic phases of settlement (6,900-5,700 cal. BC) and both are from operation III of the main tell. Unfortunately, their exact phase within this period is unclear at present. They were recovered from neighbouring squares and thus spatially they were no greater than 10m horizontally (north to south) from each other (table 8.26). Yet neither object was recovered with any other artefacts neither in direct association nor within a 1 metre radius. The thicker objects (possible stamp seal CO#287) was found in an open area. CO#105 came from an open area which contained nearby (within the $10m^2$ excavation square) a burial, a number of fire pits, a hearth and a round building (table 8.26).

-"Miniature Vessel, Tokens"

The 15 objects published as the "miniature vessel" variation of a "token" (CO#s 2883-2897; Akkermans 1996b: Fig. 8.5.10-24, figure 8.8) come from distinct contexts, suggesting a distinctive function, use, and deposition of these items. All of the "miniature vessel" clay objects are found in the same area of the site: operation I of the main mound. Within this operation, the objects are found in two distinct and non-consecutive occupation levels only: 3A (towards the start of the Early Halaf phase c. 5,900-5,800 cal. BC, n=9) and level 6 (in the Transitional Halaf phase, c. 6,000 cal. BC, n=6). Despite only a maximum of 200 years separating the two sets of miniature vessels, notably no miniature vessels (as far as the published record accounts) come from the interceding levels and period of time. Across these two levels the context type is mirrored with 100%

of level 6 miniature vessels and all but 2 of the level 3A miniature vessels (one has no information and one come from an open area), a total of 86.66% of miniature vessels coming from a room within a rectilinear-shaped building. Furthermore they cluster in two rooms and buildings in particular: room 11 of building I in the Early Halaf (n=7, 77.77% of the level 3A "miniature-vessel tokens") and room 6 of building II in the level 6 Burnt Village (n=4, 66.66% of level 6 "miniature vessel" clay objects; table 8.27). In both levels, most of the objects from these two rooms were found in very close proximity to one another-as seen in their shared loci and loci-lot combinations (table 8.27).

Operation I is a village of significant size, occupying around 15m^2 excavation squares and with around 12 buildings at its height. This makes it even more remarkable that all of the of the level 6 "miniature vessel" clay objects are found in the east and south east of the village (half in the same 10m^2 area, square Q13); 200 years later, the 7 "miniature vessel" clay objects from level 3A were recovered within the same small (10m^2) area (excavation square Q13). It seems like that these objects were used together as a group. They were stored and perhaps only used in areas of the village. Their deposition together in two distinct rooms across two levels of occupation suggests these were valued and rare objects, with a specific function. Though of a similar overall appearance, as noted in section 1 above, there is variation within the miniature vessel category. As shown in the operation I "objects diversity" case study section above, this area of the site has an increased proportion of objects of "other" three-dimensional shape. Operation I's n=21 "other" shaped clay objects are dominated by these 15 "miniature vessel" clay objects. The fact that they are so numerous, and cluster in a distinct area of the site (operation I), 100%, distinct context type (rooms within rectilinear buildings, 86.66%) and levels of occupation (100% from Levels 6 or 3A) would hint at a distinct function for these miniature vessels. No other clay objects have been recorded as coming from the locus-lot of all the level 3A "miniature vessel" clay objects, the vessels appear to have been housed in this room without other types of clay objects, pointing to a distinct function of these vessels in level 3A of operation I (yet these may have been recovered and not yet have been published individually, by level). However in level 6 of operation I, Q13 112 (square and locus) 3 "miniature vessel" clay objects plus 12 "tokens" of other shapes were all recovered suggesting they were at least stored and possibly used together (i.e. from the same sector of room fill-volume unquantified).

-"Anthropomorphic Cones"

The distinctive manufacture and appearance of the 15 anthropomorphic cones suggests these objects may be better classified as figurines, rather than as geometric clay objects. In support of this interpretation, contextual evidence hints at a distinctive use and disposal of the anthropomorphic cones (CO#s 109, 114, 129, 130, 137, 150, 158, 183, 203, 208-9, 226, 272-3, 325) (figures 9.31 and 9.32). Almost all come from operation III of the main tell, with just 2 from Sabi Abyad III (one of these is plain and the other has applied circular decoration, thus both plain and decorated types are represented in both site areas). All are from the Late (ceramic) Neolithic, the only objects with a clear level comes from A-3 of operation III – towards the end of the Early Pottery Neolithic phase (dating to approximately 6,350 cal. BC, table 8.28). Like all objects, around 30% come from internal contexts with the majority coming from open context types. n=4 come from a room in a building, within one being found *in situ* on the floor of a room. Of the external area objects, n=2 come from courtyards and 1 comes from the so-called "Death Pit" (a large open area containing a number of burials plus many broken clay artefacts including clay objects and figurines) (see figure 4.3-7, Chapter 4.3 and table 8.28). All other external area objects come from square full of architecture and other features; therefore none were recovered from large, empty open spaces. Many of the anthropomorphic cones were recovered in direct association with other artefacts. CO#150 for example was found sat next to an anthropomorphic figurine (object number 43). Within the wider area (same locus and lot) was a bronze dagger, a fragment of a conical clay object and a fragment of a grinding slab.

-"Bullae": CO#s 2915-18

The most enigmatic objects from the Tell Sabi Abyad recorded object database and not technically small geometric clay objects (in the sense the term is used in his study) are the four bullae (figure 8.17 and figures A.F-9 and A.F-10, Appendix F). All come from the same room of the same building (figure 8.57), the Burnt Building (or building I) within square V6, operation II (main tell). As the name suggests, this tripartite building was heavily burnt and contained the crouched inhumation of an adult female and a large number of finds (see Chapter 4.3 for more detail of the architecture and phasing of operation II, V6) (Akkermans, Brüning *et. al.* 2012: 307). Activity within V6 covers over 1,000 years from 7,000-5,800 cal. BC (Akkermans, Brüning *et. al.* 2012: 307) with all bullae dating from levels within a single phase; the Pre-Halaf phase (c. 6,200-6,100 cal. BC). Their context provides overwhelming evidence for their use, in conjunction with

clay objects, in an administrative context (being cached with many other clay objects-within a room of a building.

A total of 371 finds were found inside the building-over all levels and rooms (see table 4.3-2, Chapter 4.3). Clay objects, recorded as "tokens" (which includes the four bullae) total 57, constituting 15.36% of all finds from the building (aside from pottery). The Clay objects and the bullae appear to have been used and stored together. Evidence of this comes not only from the ovoid-shaped clay object shaped impressions found on the inside of the bullae fragments, but also in the fact that more than half (n=34 or 59.65% of all clay objects) come from room 3, the room all bullae were found in (table 8.29 and figure 8.59). Sealings are also found in large numbers in room 3 (n=22, 33.33% of all sealings) (there are also large numbers of sealings and clay objects in room 1), suggesting all three artefact types; clay objects, sealings and bullae were used together, at least in this room (table 8.30). However these three categories of artefact did not have to be stored or used as a group, bullae only appear in room 3. In addition room 5 contains 30 sealings, yet only 5 clay objects. Within room 3 (the bullae room), ground stone tools are the largest artefact category; constituting 32.14% of the room's finds. Next are clay objects at 30.36%. Sealings constitute 19.64% of the room's objects (table 8.31 and (figure 8.59). All other artefacts are present in the room in far smaller proportions only, emphasising the link between clay objects, sealings and the bullae.

All evidence from the rectangular or "T-shaped" Burnt Building of 10 by 7 metres (see Chapter 4.5 for full description) suggests this building served a special and distinctive purpose. Room 3, the room holding the four bullae is one of the smallest rooms (along with rooms 4, 6, 7 and 8, see figure 4.3-9, Chapter 4.3), measuring just 1.5 square metres, yet contains by far the highest number of artefacts. Room 3 holds nearly one third of all artefacts recovered from the burnt building (30.19%). Only room 1 holds more, yet is more than twice as large (33.42% of the buildings total). In contrast to room 3, the four other small 1.5m^2 rooms all hold extremely small numbers of artefacts (between 0.27% and 3.23% of the buildings' total artefact count), therefore the nature (the high proportion of clay objects and sealings) and sheer number of finds from room 3 point to a distinctive, storage function of this room. The significance of the bullae is great – they were all broken, with the clay objects they held being removed, yet the fragment of each bulla (and likely the clay objects contained inside) were retained, and achieved inside the room. Perhaps the clay objects that had been held inside were kept as a verification of the transaction even after the transaction was completed and the bullae smashed.

8.4-SUMMARY & DISCUSSION

(i) The Objects

As the tier 1 clay object assemblage represents only a small and arbitrarily selected proportion of the estimated thousands of small geometric clay objects recovered from Tell Sabi Abyad, any conclusions drawn, especially regarding the presence of objects with unique characteristics, must be tentative. The tier 1 Tell Sabi Abyad clay objects are diverse in shape, with a large proportion of spheres, discs and cones. As a group, the objects within each shape category are far more standardized than the clay objects seen at the other two case-study sites (see Chapters 6 and 7), yet in size, a range of sizes are present, certain shapes do not come in a "small" and "large" versions for example. Yet within certain shape categories, there are a smaller number of clay objects which can be further classified as homogenous due to them sharing of a number of characteristics in addition to shape alone. A number of (tier 1) discs, for example, can be distinguished by their larger size and the presence of intricate and dense (plant and other) impressions covering one or both sides. All tier 1 Tell Sabi Abyad clay objects share a high level of standardization in manufacture. They are generally well-crafted into a clearly defined shape. Intentionality of craft is further highlighted by the fact that 100% are intentionally hardened and a large proportion, compared to other case study sites, display intentional decorative markings.

Like Boncuklu Höyük and Çatalhöyük, Tell Sabi Abyad's clay objects exist in a graduated range of sizes, even within specific three-dimensional shapes. However, overall, the clay objects of Tell Sabi Abyad appear to have been produced in are far more standardized environment as within each shape category, a greater level of shape definition is evidenced. This is further enhanced by the presence of even more homogenous sub-sets of clay objects within the already uniform shape categories. Even within the generally diverse "other" category, the tell Sabi Abyad tier 2 objects can be further sub-classified into groups within this (vessels, flat triangles and so forth). Therefore, each set of objects within each three-dimensional shape is easily identifiable according to their shape. This increased shape definition and clay object standardization is partly explained by two factors. Firstly, in contrast to the other case-study sites, the clay objects of Tell Sabi Abyad are overwhelmingly hand-picked direct from the trenches, rather than emerging during the flotation, sieving and residue sorting process (see discussion of site excavation and finds retrieval processes in Chapter 4.). The human eye would far more readily identify finely executed clay objects of a clearly defined three-dimensional shape from the ground, than crudely made, fragmented clay objects (which may appear to be a

natural clump of soil). Secondly, as a significant proportion of the Tell Sabi Abyad assemblage comprises published objects, the effect of this must be taken into account. Most commonly the special, well-made, unique, and well-defined geometric clay objects will be published. The crudely finished, incongruously shaped, fragmented and damaged examples are far less likely to be selected for on-site photography, drawing and eventual publication.

Like the discs, a distinctive set of cones ("anthropomorphic") is readily recognisable, despite cross-cutting the pre-defined sub-shapes within the "cone" category. These "anthropomorphic cones" are more rounded and squat than Tell Sabi Abyad cones in general, many have a tip which leans to one side. They also have a distinctive form of decorative marking, running most commonly around the base, but also found in other locations. This suggests that unlike other assemblages, the pre-set shape types and sub-types are not as useful for the Tell Sabi Abyad assemblage. Perhaps the "anthropomorphic cones" represent schematic women. The rounded nature of these cones could be said to be suggestive of the female form and are thus figurines. However, no human characteristics are rendered on any of the examples, nor do we have objects similar but with the addition of a human characteristic; legs, a nose, or eyes for example. This is unlike items in the Çatalhöyük assemblage (Chapter 7 and Appendix C), where grades of anthropomorphism, showing the full transition from a pure cone of straight sides to a schematically rendered human form, to a clear human are evident. At Tell Sabi Abyad, it is the care of craft, and this alone, which leads some to suggest these cones are figurines. The same is true of the fragmented geometric covered in rows of fingernail impressions (figure A.F-6, Appendix F).

Aside from the examples above, little correlation across the many object variables recorded (clay colour, texture, presence of markings and impressions, evidence of burning etc.) aside from three-dimensional shape (with its increased level of shape definition and standardisation) is seen within the tier 1 Tell Sabi Abyad assemblage. Cones do not come in a limited or set range of sizes, a specific colour, or always display fingerprints for example. Yet it must be remembered that only a small proportion of the estimated total number of excavated clay objects are under study here. In contrast, the clay objects recorded at tier 2 level represent a far more analogous set of small geometric objects. Almost all are made of unfired clay and the stone objects are similar in all aspects to their clay counterparts – aside from raw material.

Despite differences in overall patterning, much correlation is seen across Tell Sabi Abyad's two tiers as expected. For example, in shape, the two flat triangular shaped objects (CO#s 187 and 205-recorded at tier 1; figure A.F-7, Appendix F) are very similar to the published "triangle" (CO#2880, figure 8.7). In craft technique and decoration, similarities are also clear; such as the deeply incised dots on the published "gaming piece-token" (CO# 2281, figure 8.16) and the cone-like shaped tier 1 object (CO# 226, figure A.F-8). Fingernails are used as decoration on both tiers of Tell Sabi Abyad objects in a multitude of ways (i.e. CO# 2861, 2851, 2835, and 294. See figures 9.13, 9.14 and Appendix F figure A.F-7). The tier 1 assemblage in particular has many examples of "marked" objects; some (such as the discs) completely covered others with one or two very distinctive markings. All are clear and intentional and therefore likely to have been meaningful: serving as a way of differentiating the objects, in addition to shape alone.

(ii) Their Context

As Tell Sabi Abyad is a large site, comprising a number of tells, it likely consisted of a number of villages with overlapping occupation periods. The tier 1 objects were randomly selected, yet these 293 clay objects represent finds from only two different areas. Therefore a representative sample of all types of small geometrics from Tell Sabi Abyad's four mounds and 1,000 years of occupation is *not* present. This is especially true if on different parts of the site and in different phases of occupation; different methods of counting, accounting, recording, game playing and symbolic behaviour were in existence. Though the entire studied collection (tier 1 and 2 recorded objects) of Tell Sabi Abyad comes from a limited range of site areas and varying proportion of each area's total estimated "total" count, analysis of the context of the 393 studied geometrics concedes some compelling trends.

Small, geometric clay objects are more commonly found in "external", open air contexts (as opposed to internal spaces) and in "fill", rather than as part of structural material. Those found in open spaces tend to be recovered as lone, single objects where as those from internal spaces most commonly come from the fill of a room of a building. "Building" context clay objects are commonly found deposited in pairs or clusters of at least one other "token" plus a range of other artefacts including sealings and jar stoppers. The appearance of Tell Sabi Abyad's clay objects does appear to play a factor in the nature of their context. Looking at specific areas of the site, the proportion of clay objects of different shapes changes, most notably in operation I where this can be seen according to building shape within the level 6 village.

In addition, analysis of the context of some of the *notable* single and groups of objects (section 8.3e above) from Tell Sabi Abyad confirms this is some circumstances. The cube-shaped clay object comes from room fill. This fill contained many other types of clay objects and other artefact types. The collection of "miniature-vessel tokens" are all found in two specific levels of the same area of site. Moreover, they cluster in the west/southwest of the area, with the majority coming from just one $10m^2$ excavation square. Almost all miniature vessels come from within a room of a building (the majority from just two rooms in two buildings) and all are found with the same types of associated objects. This evidence all suggests clay objects, when stored at Tell Sabi Abyad, were stored in specific locations – rooms within buildings with other artefacts according to, yet not limited by, shape. Distinctive and decorated clay objects are no more likely to be stored with other artefacts within in rooms than plain items. The "incised cylinder", "gaming piece-token" and some of the decorated anthropomorphic cones show that decorated items can also be found alone in external open spaces.

Despite Tell Sabi Abyad having a long span of occupation, the small geometric clay objects from the site are found in significant numbers only in certain occupational phases (notably the Transitional Halaf phase c. 6,000 cal. BC) and are absent altogether (at least in the tier 1 and 2 data) in others. They are also far more common in the Ceramic Neolithic levels than the PPNB. Within these phases, they tend to cluster within specific and certain levels, suggesting that their use was not consistent over a broad cultural phase, but limited to specific levels – and likely activities carried out within them (such as level 6 of operation I's Transitional Halaf phase and Levels B-8 and A-4 of operation III, dating to the Pre-Halaf and Early Pottery Neolithic, respectively). However caution must be taken when evaluation the meaning of this temporal clustering of clay objects; other occupational phases of operation I have far less buildings. Level 6 is by far the most dense in structures, and as almost all clay objects in operation I come from structures, this explains the concentration of clay objects in this level. Archaeological preservation is another issue; the Burnt Village of level 6 is extremely well preserved in contrast to other phases of settlement and other operations and tells within the greater Sabi Abyad complex, again explaining the large number of clay objects from this village.

(iii) Object Function

Taking the considerations above into account, the remarkable level of preservation, and high number of clay objects found within the buildings of the Burnt Village, the level 6 village of operation I at Tell Sabi Abyad does provide the best direct evidence for the

function of clay objects at the site. Evidence from this phase and area of settlement, combined with the overall picture gleaned from Tell Sabi Abyad, is the most informative of the three case-studies. The Burnt Village provides clear evidence of the use of objects of certain shape combinations (a wide variety of shapes, yet dominated by spheres, miniature vessels, flattened/semi spheres, type 2 discs, type 1, cone type 1 and cylinders) within specific internal contexts, alongside sealings within buildings housing stored goods. Rather than being evenly or randomly distributed across buildings and rooms, the clay objects are clustered in a small number of rectilinear buildings and rooms within them. The fact that clay objects are far more common in the rectilinear buildings compared to the tholoi, and the restricted range of shapes present in the tholoi clay object collections, points to the former being the main location of the storage and administration of goods. The clustering of clay objects together suggests they were kept as a record of economic activity, retaining information to be referred back to at a future date.

Operation I suggests that in one particular level of occupation only, clay objects were being utilised in an administrative fashion at Tell Sabi Abyad. No other levels of occupation within operation I display such evidence. However, excavation of the contemporary operation II intriguingly displays similar evidence in the presence of a burnt building, divided into a number of compartments (some large, many small, around $1m^2$), with a restricted range of the smallest rooms containing high numbers of clay objects and sealings, in addition to bullae. Once again, operation II demonstrates that clay objects are clearly being used in conjunction with other items in an administrative activity at Tell Sabi Abyad. Considering the evidence from these two burnt occupations, independently from the published Burnt Village interpretation heavily influenced in its argument, by the work of Schmandt-Besserat, both the Burnt Village of operation I, and the burnt building of square V6, operation II clearly attest to the use of small clay objects in the accounting and recording of information related to stored goods at the site.

Evidently, clay objects were created, used, and then stored in order to administer goods at Tell Sabi Abyad. Yet this administration system, the details of which still remain unclear, did not operate across all areas of the site, and was used only during certain discrete time periods. Neither did the systems of operation I or II encompass all types of clay object. The "anthropomorphic cones" can be excluded as administrative aids, and as clay objects of various forms are found in all areas of settlement and time periods at Tell Sabi Abyad, clay objects must have been multi-functional tools here. In addition to

sealings and clay objects, an early form of bullae (CO#s 2915-18), along with stamp seals (suggested by CO#s 105 and 287) form part of the administrative kit, at least within operation II of Tell Sabi Abyad. The evidence from Tell Sabi Abyad lessens the plausibility of the accounting interpretation at Boncuklu Höyük and Çatalhöyük. Yet Tell Sabi Abyad bears similarities to evidence from other Late Neolithic, north Mesopotamian sites such as Tell Halaf and Tell Arpachiyah (see map figure 4.1, Appendix H and discussion in Chapter 9). It certainly seems that in the late 7th and 6th millennium cal. BC in upper Mesopotamia, villagers (in certain phases of settlement only), were developing and practising a new and complex way of accounting for economic acquisition, exchange and storage.

THE ROLE AND FUNCTION OF "TOKENS" AND SEALING PRACTICES IN THE NEOLITHIC OF THE NEAR EAST:

THE QUESTION OF EARLY RECORDING SYSTEMS, SYMBOLIC STORAGE, PRECURSORS TO WRITING, GAMING, OR MONITORING DEVICES IN THE WORLD'S FIRST VILLAGES.

VOLUME TWO

Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor in Philosophy by

Lucy Ebony Bennison-Chapman

July 2014

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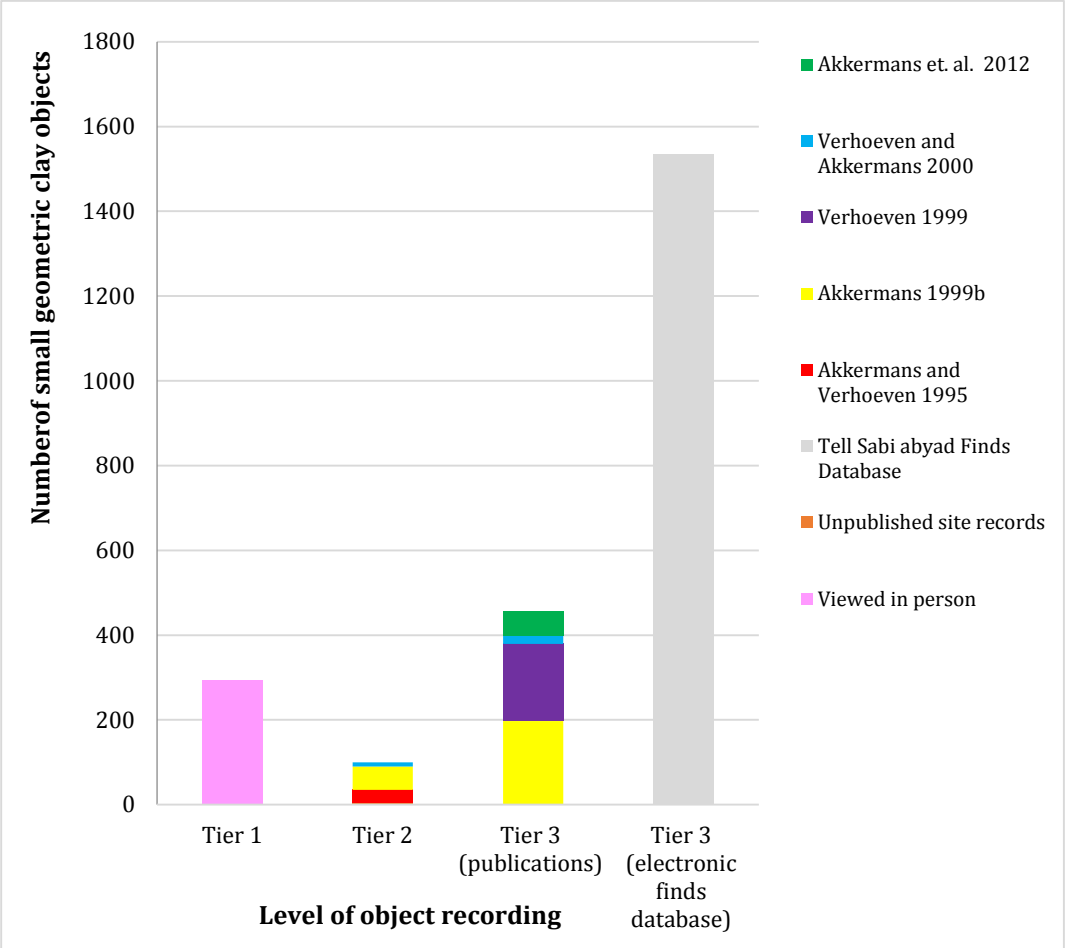


Figure 8.1: Total number of clay objects recorded (tier 1 and 2) and studied (tier 3) according to data source.

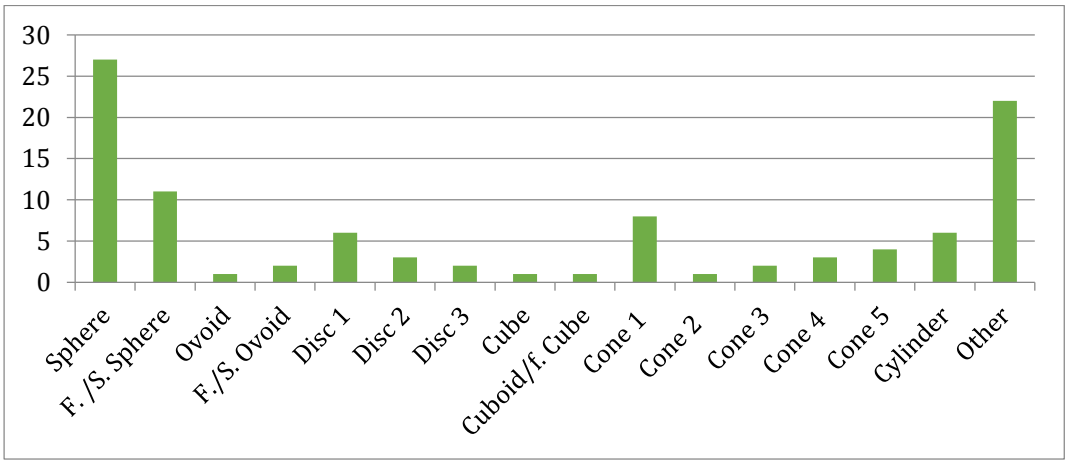


Figure 8.2: Number of clay objects by three-dimensional shape within the tier 2 Tell Sabi Abyad assemblage (n=100).

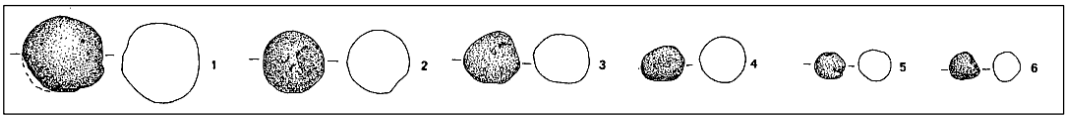


Figure 8.3: Examples of spherical shaped clay objects recorded from Tell Sabi Abyad publications. Left to right: CO#s 2819-2824 (Akkermans & Verhoeven 1995: fig. 14.1-6, p. 24).

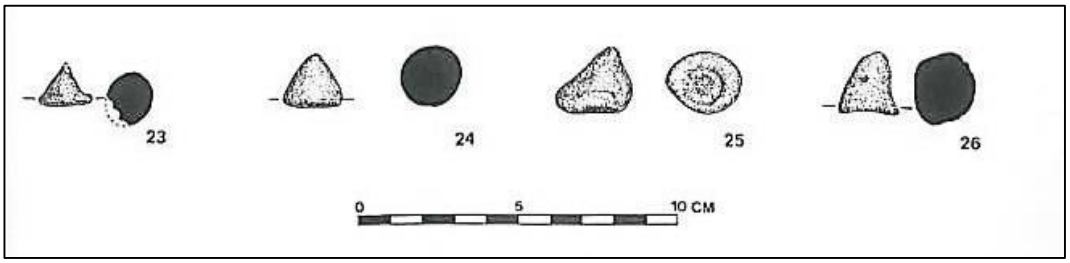


Figure 8.4: Selection of cone shaped clay objects recorded from Tell Sabi Abyad publications (tier 2). Left to right CO#s 2872-2875 (Akkermans 1996b: Fig. 8.4, 23-26, p. 465).

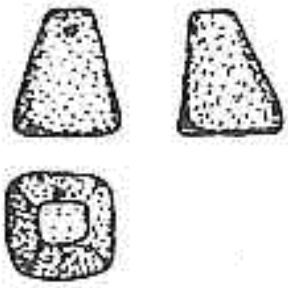


Figure 8.5: CO# 2879: whitish stone (gypsum or rock-crystal) type 3 cone with square base. (Akkermans 1996b: fig. 8.5.5, p. 466).

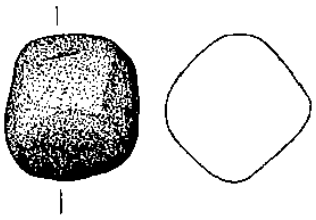


Figure 8.6: CO# 2914. The cube shaped limestone object published as a "hammer-stone". Traces of ochre were found on the sides (Verhoeven & Akkermans 2000: fig. 4.7.6, p. 117).

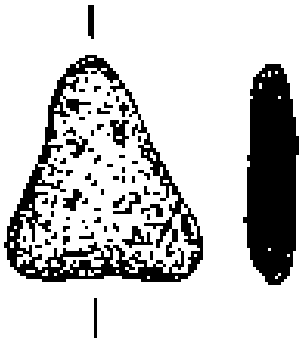


Figure 8.7: CO# 2880: two dimensional triangle shaped object recorded as "shapeless/too fragmented/other". Stone (unidentified). (Akkermans 1996b: fig. 8.5.6, p. 466).

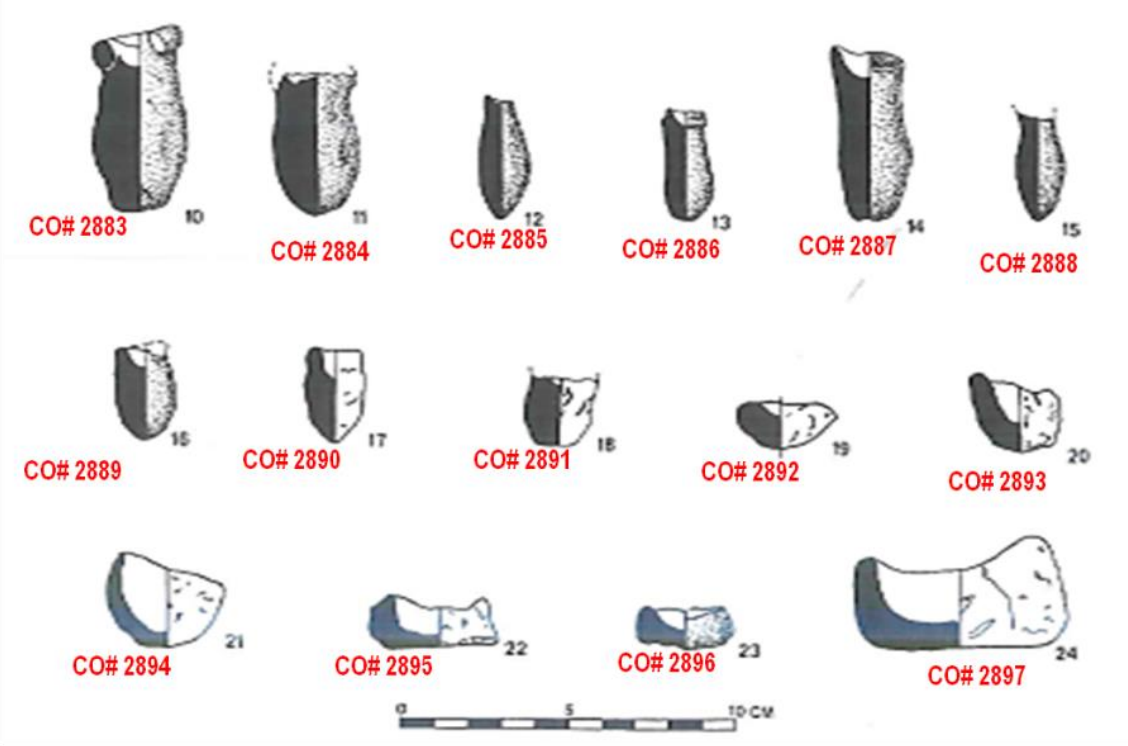


Figure 8.8: CO#s 2883-2897: all published as "vessel-token". (Akkermans 1996b: fig. 8.5.20-24, p. 466).

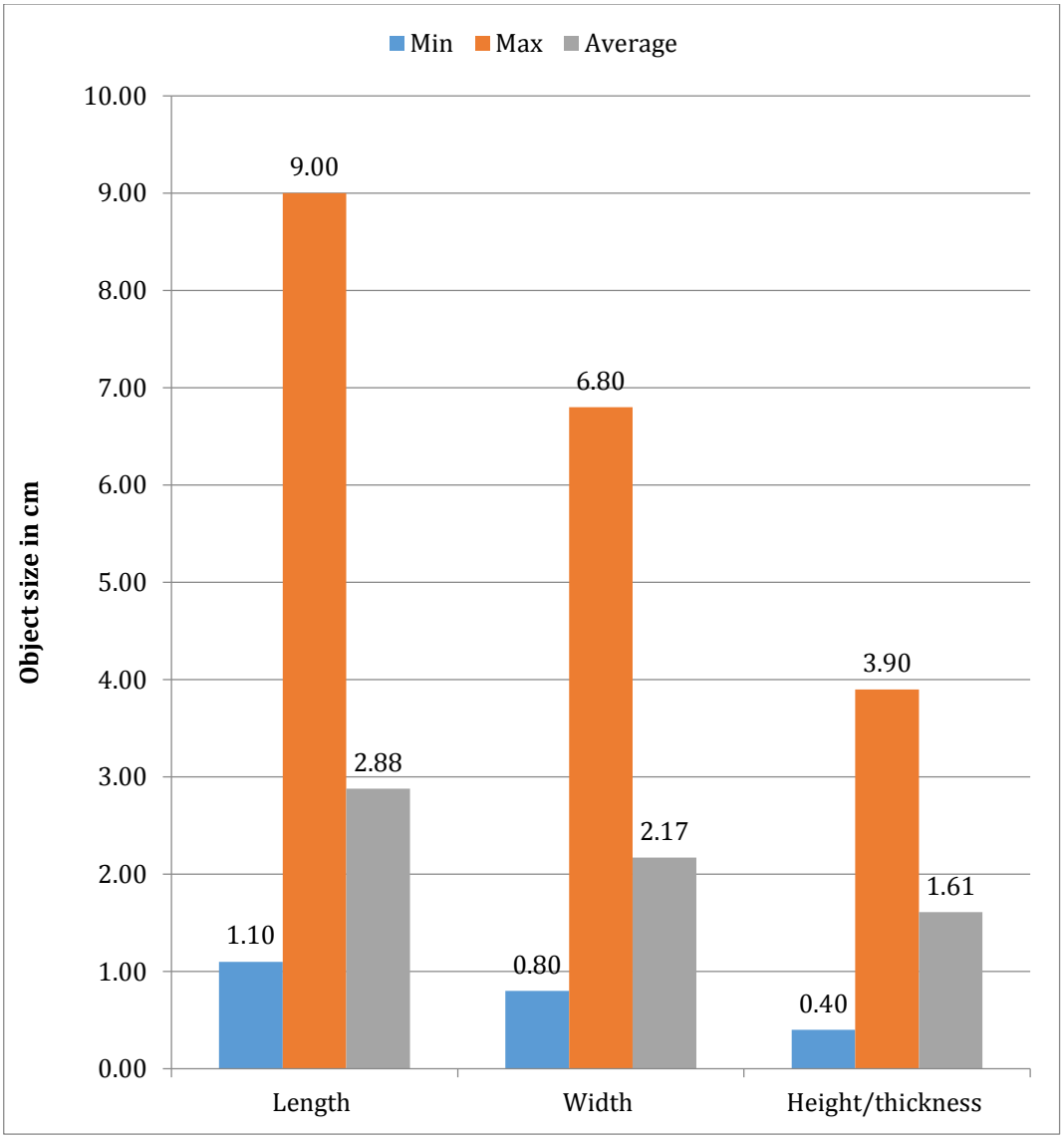


Figure 8.9: Minimum, maximum and average dimensions of all tier 2 clay objects at Tell Sabi Abyad (n=100) according to the three-dimensions measured: length, width and height/thickness.

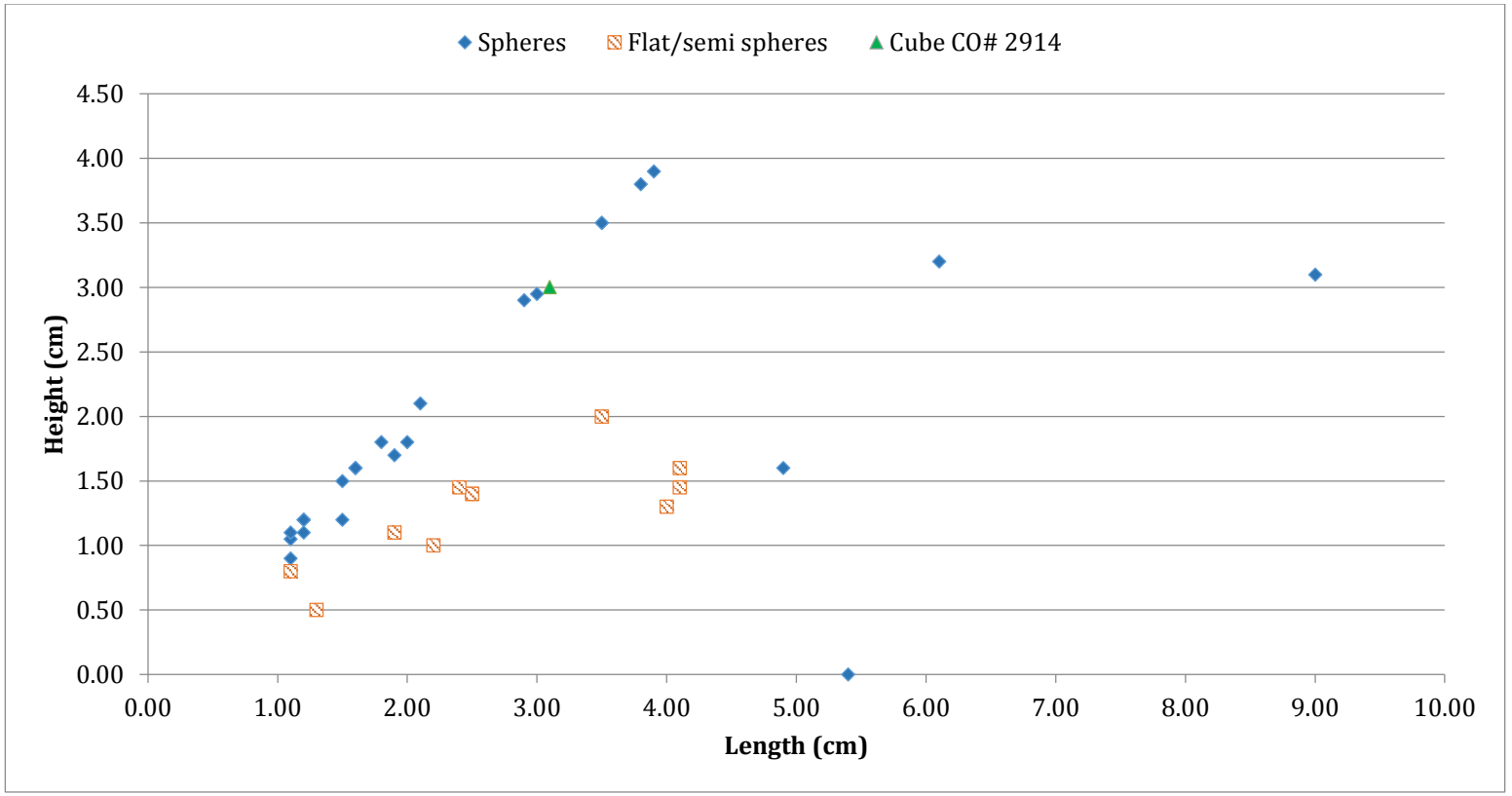


Figure 8.10: Tier 2 spheres and flattened/.semi-spheres: plan view length and width comparison. The single cube CO# 2914 is also plotted.

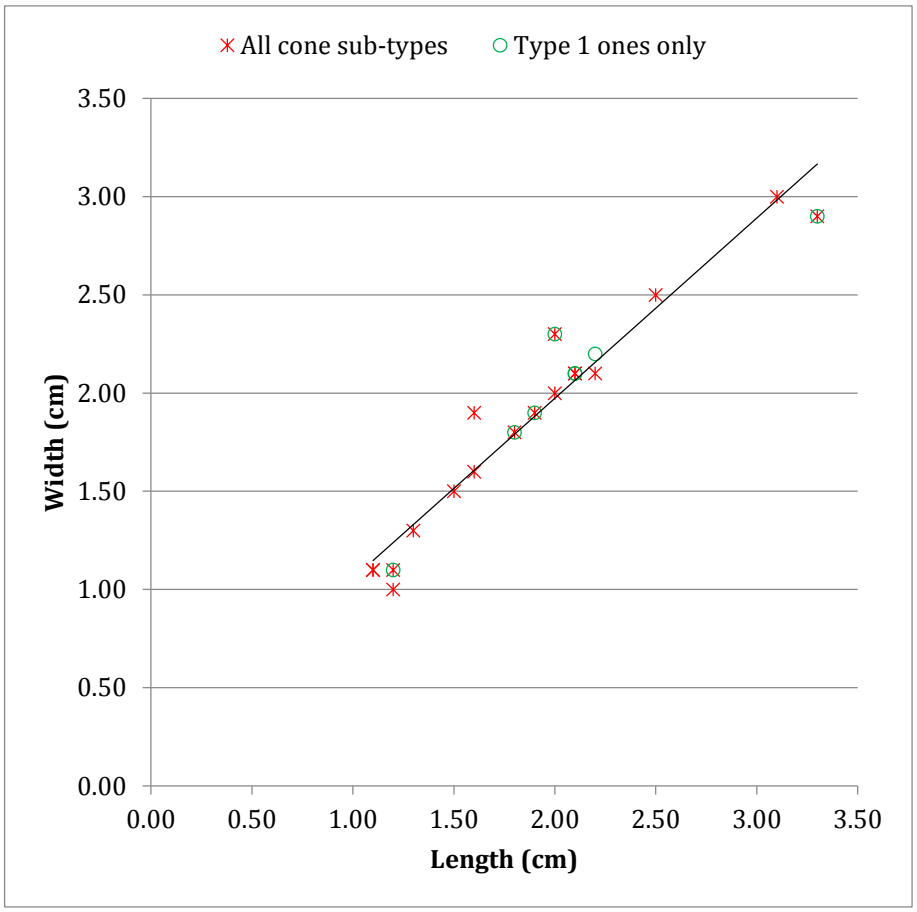


Figure 8.11: Tier 2 cones: comparison of cone base length and width; all cones sub-types combined: n=18, and type 1 cone only: n=8.

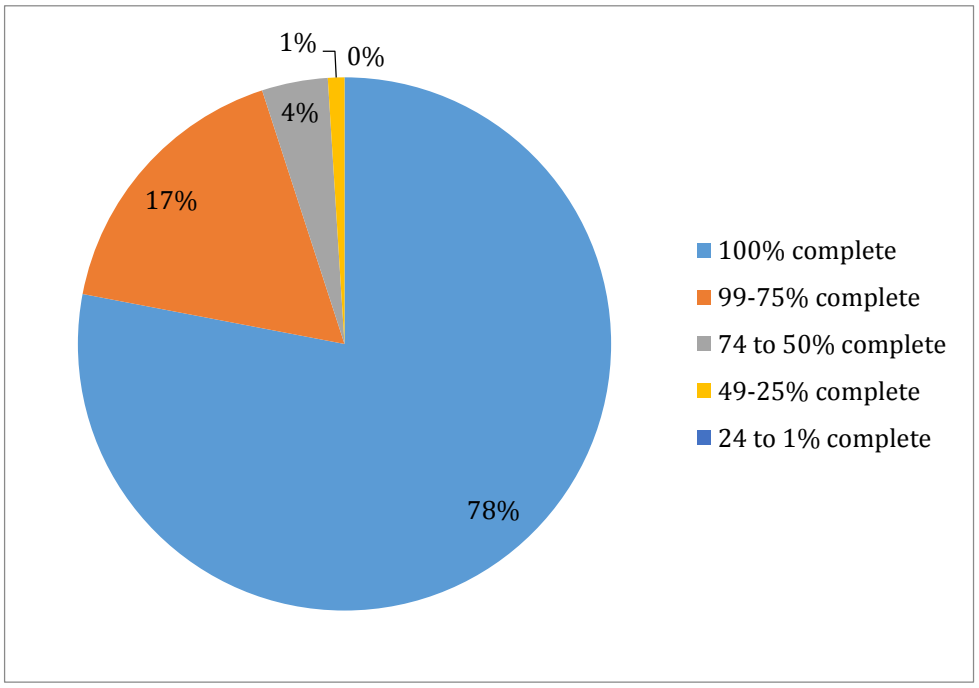


Figure 8.12: Tier 2 Tell Sabi Abyad clay objects: completeness by degree of percentage intact.

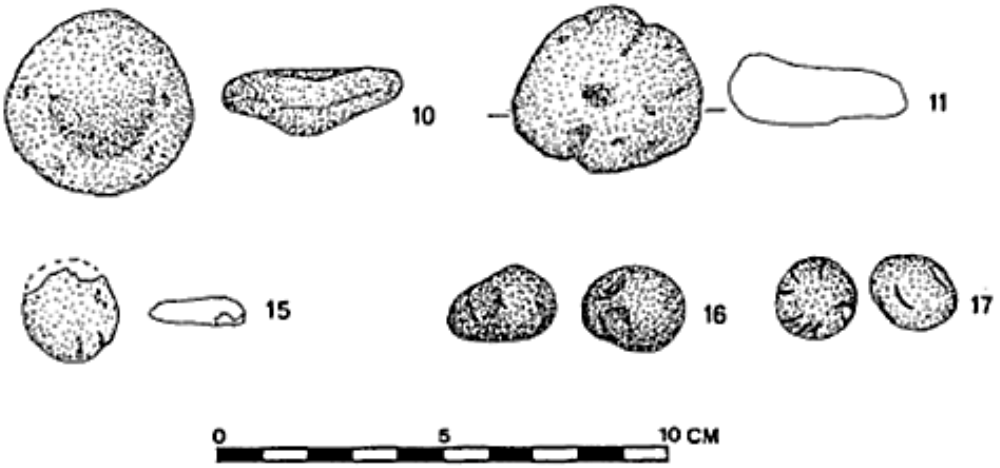


Figure 8.13: One of the "marked" clay objects from tier 2 Tell Sabi Abyad: CO# 2828 (no. 10) with "dot" in a ring on the top surface of the object. CO# 2835 (no. 17 above) also appears to have deliberate, decorative fingernail markings and other markings-yet these are not recorded in the publication and are possibly merely cracks in the clay. (Adapted from Akkermans 1996b: fig. 14, p. 24).

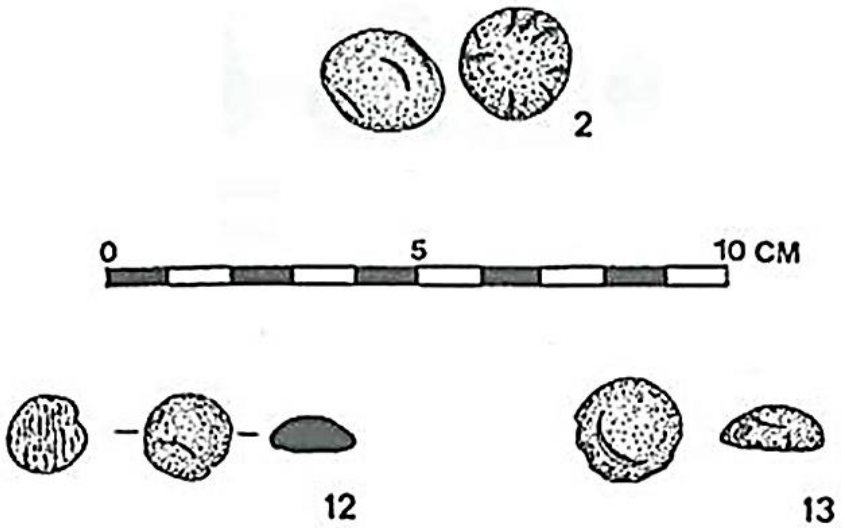


Figure 8.14: Further examples of marked clay objects from Tier 2 Tell Sabi Abyad. CO#s 2851 (no. 2), 2861 (12) and 2862 (13) clay objects displaying decorative markings. (Adapted from Akkermans 1996b: fig. 8.4, p. 465).

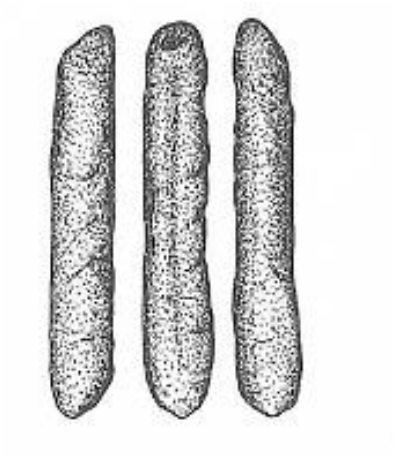


Figure 8.15: "Tally" CO# 2911. (Verhoeven & Akkermans 2000: fig. 4.7.3, p. 117, 108).

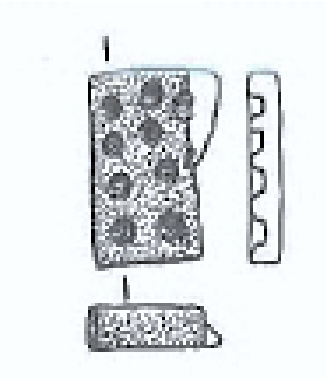
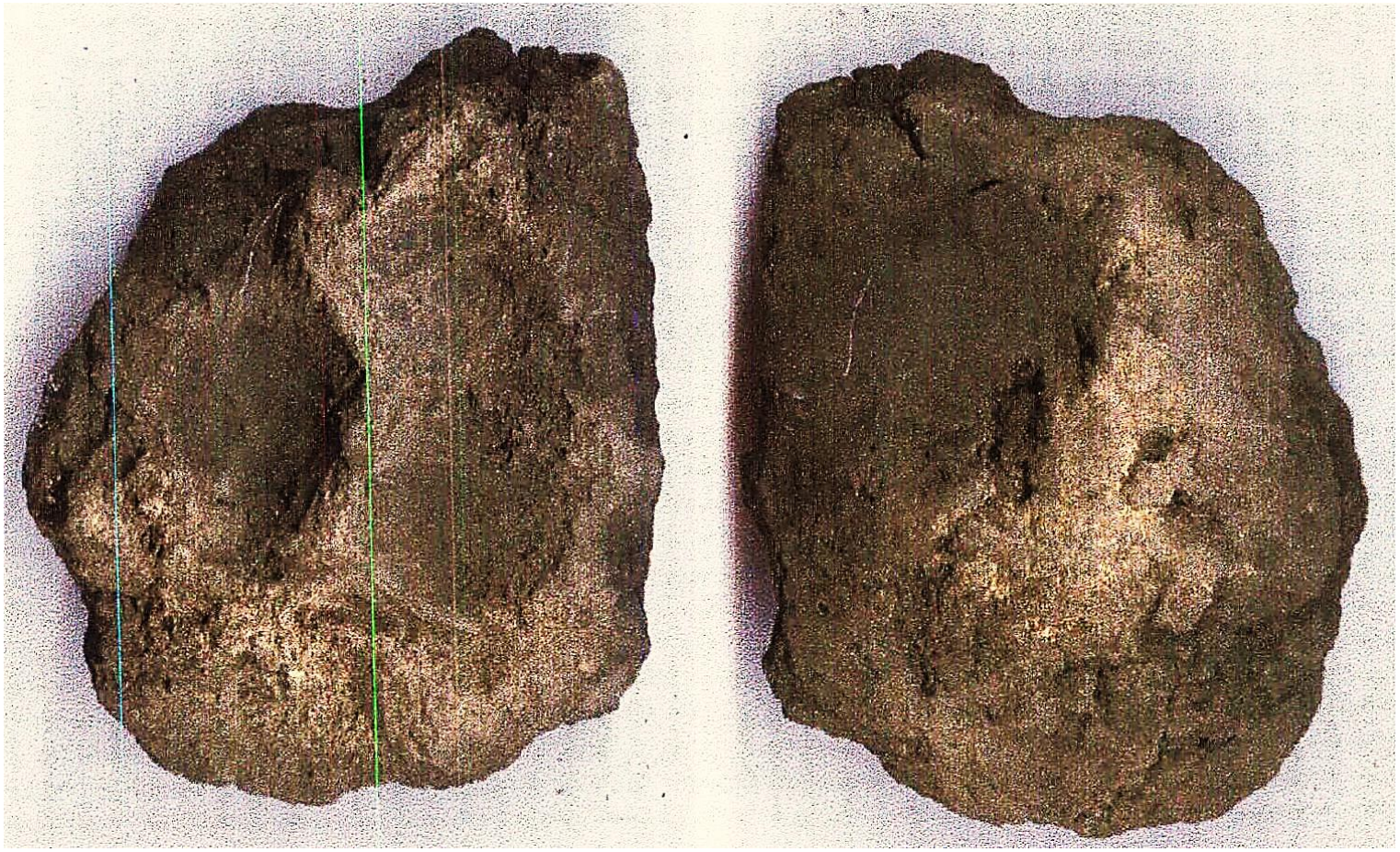


Figure 8.16: Decorated cuboid, published as the "Game piece? - token". CO# 2912. (Verhoeven & Akkermans 2000: fig. 4.7.4, p. 117, 108).

(a)

(b)



(c)

Figure 8.17: Fragments of three of the four "bullae" recovered from 2004 season at operation II, Tell Sabi Abyad. **(a)** CO# 2915 (O04-072), **(b)** CO# 2917 (O04-118) and **(c)** CO# 2918 (Z04-017). (TSAEP 1988-2010, courtesy of the Tell Sabi Abyad Project). Further illustrations of these artefacts are available in Appendix H, figures A.F-9 and A.F-10).

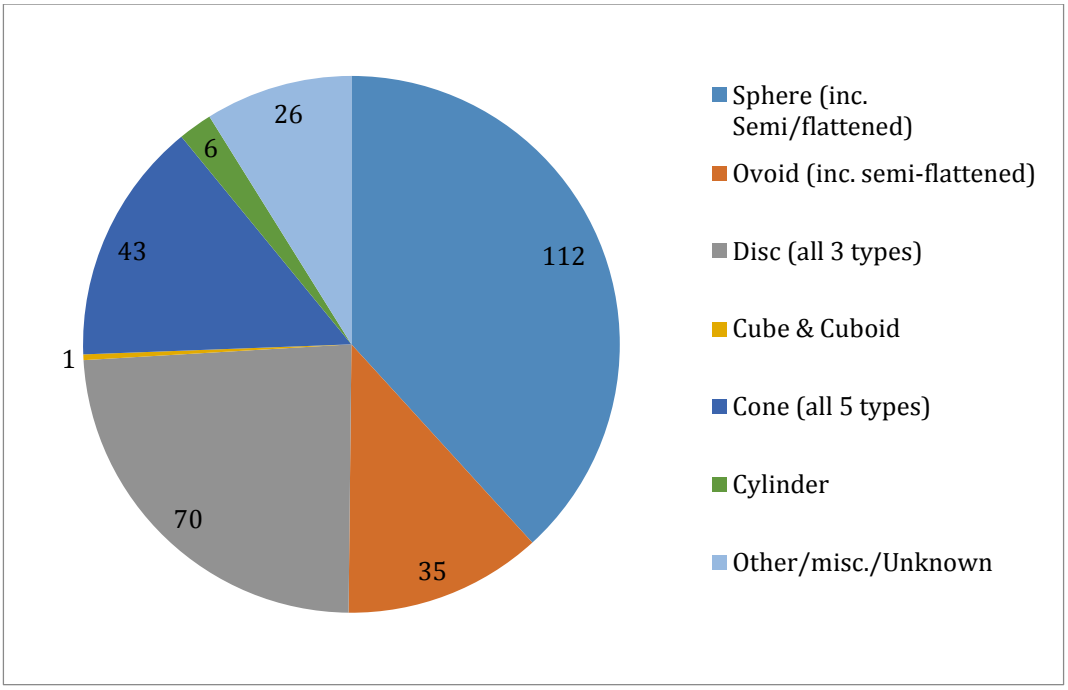


Figure 8.18: Chart demonstrating the range and proportion of clay objects by basic three-dimensional shape category at Tell Sabi Abyad: tier 1.

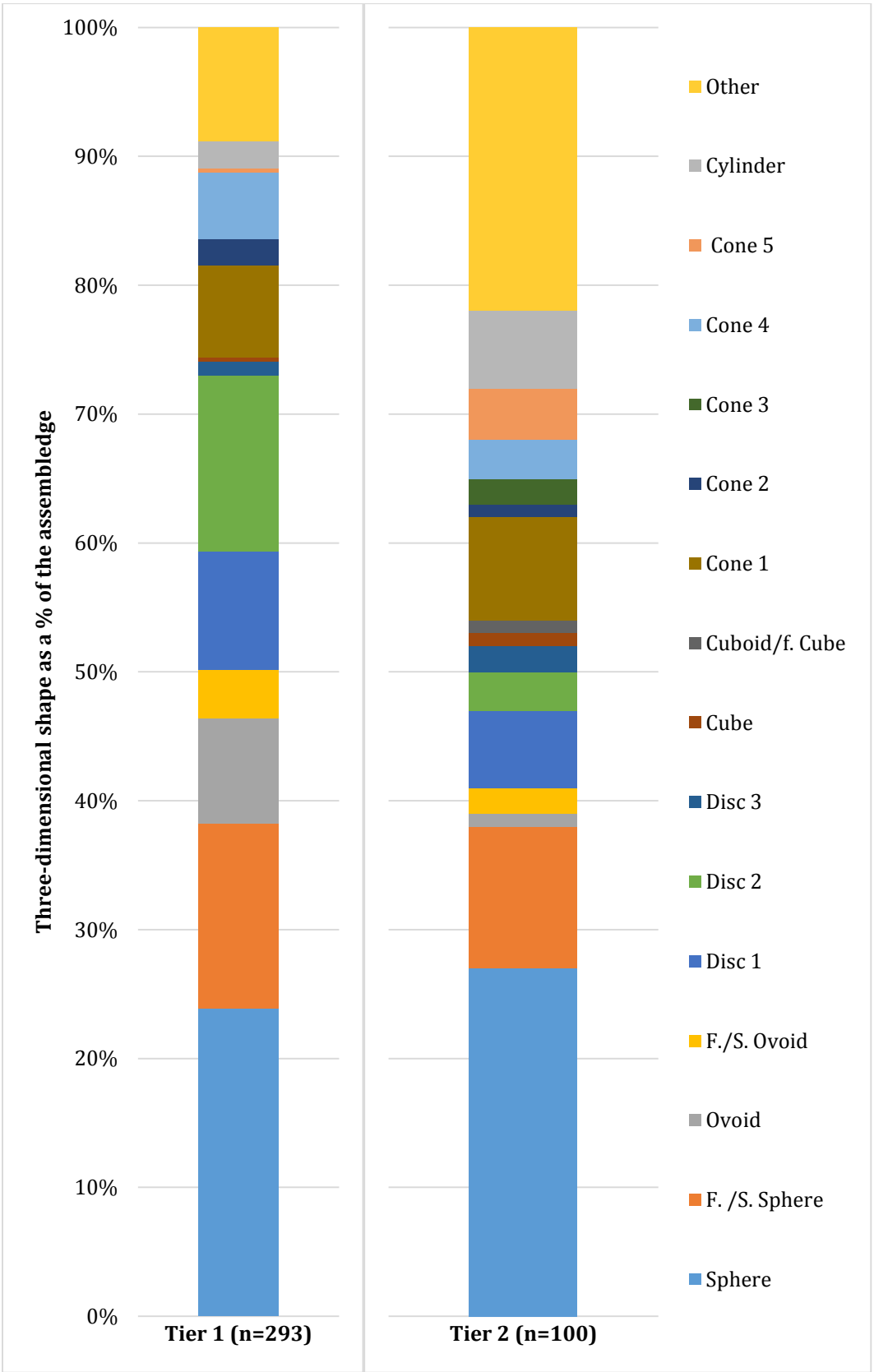


Figure 8.19: Detailed three-dimensional shape as a percentage of the assemblage's total count: tier 1(n=293) compared to tier 2 (n=100) Tell Sabi Abyad clay objects.

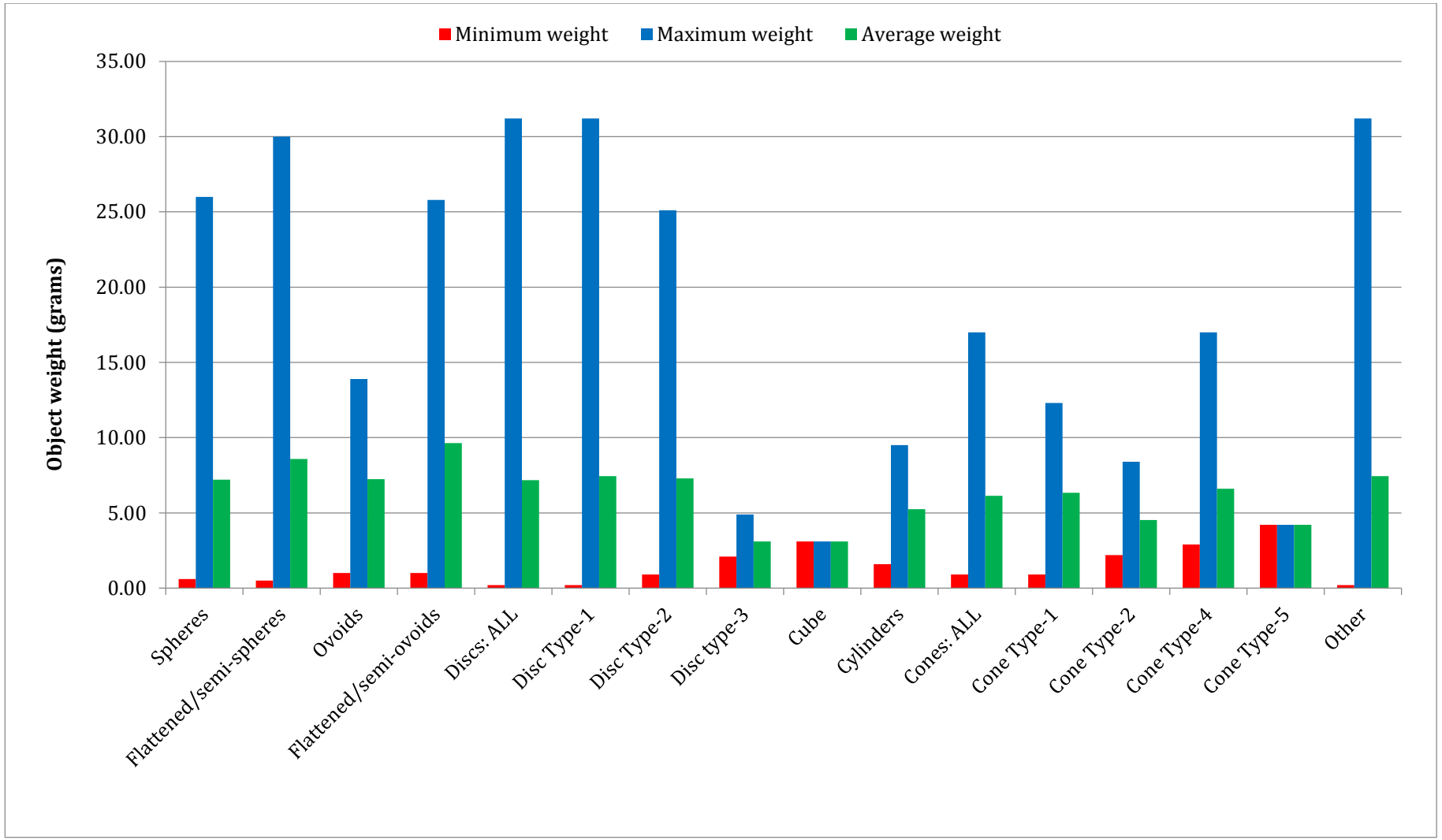
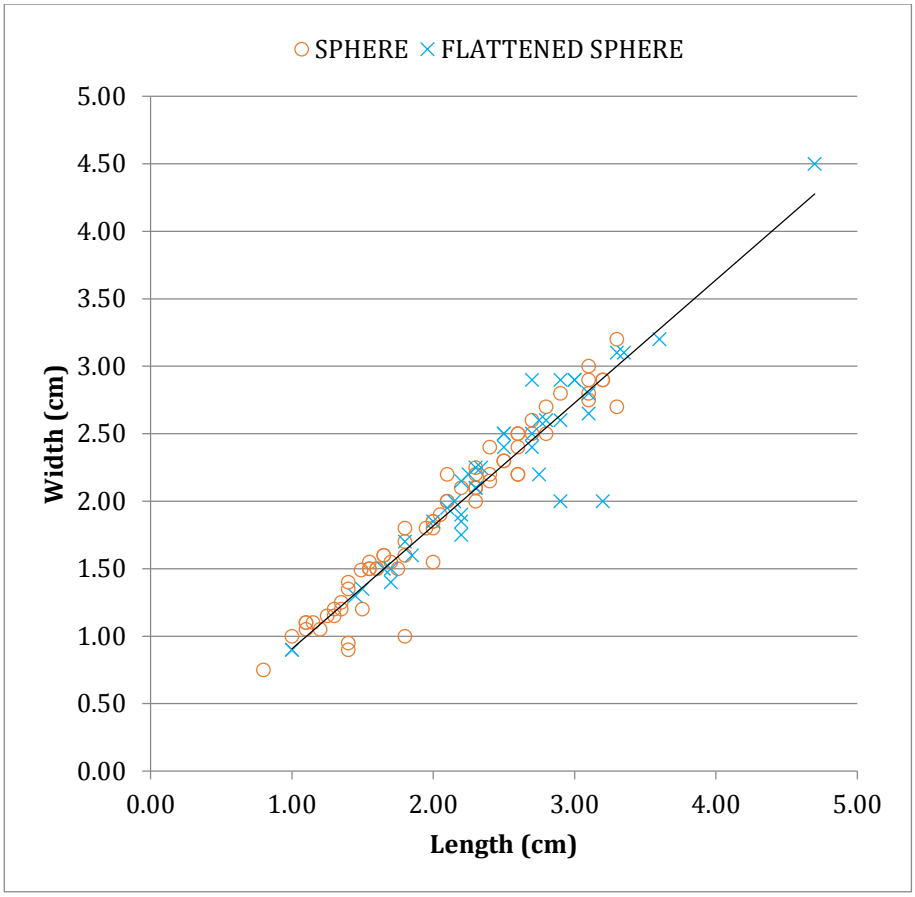


Figure 8.20: Three-dimensional shape and weight comparison: minimum, maximum and average weight in grams; Tell Sabi Abyad tier 1 clay objects.



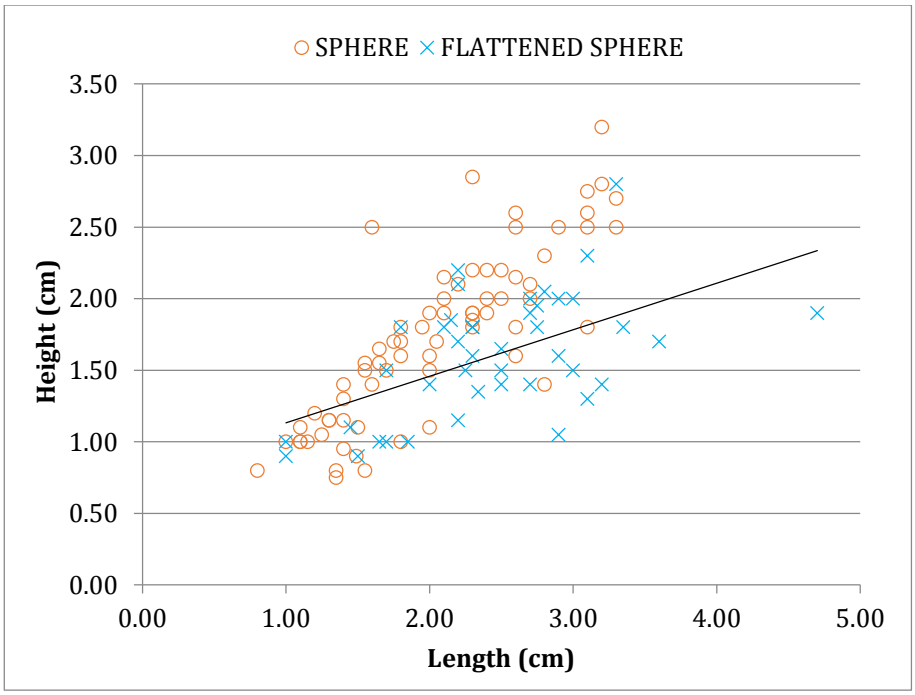
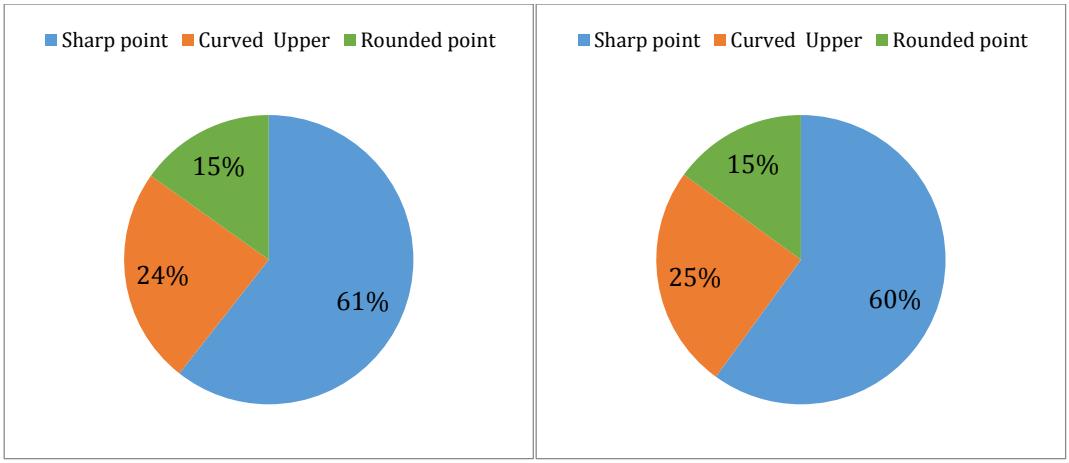


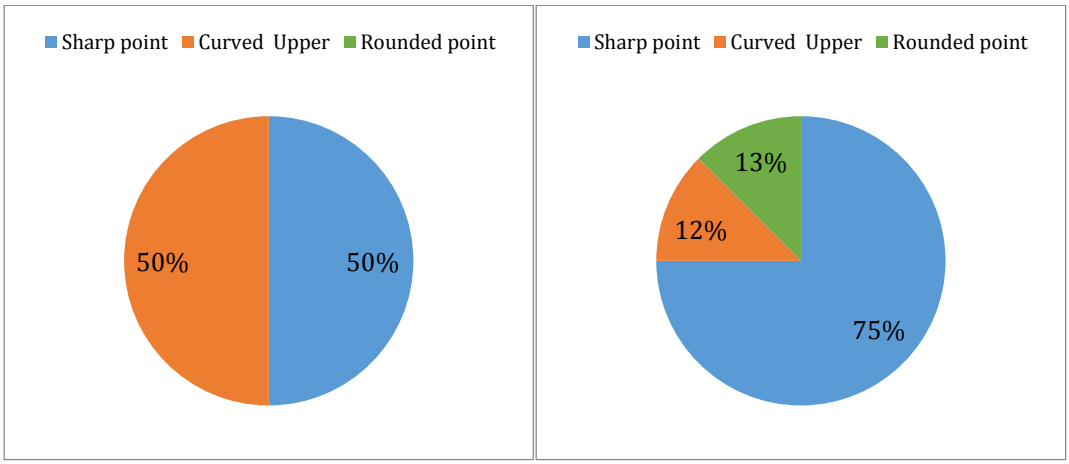
Figure 8.21: Tier 1 Tell Sabi Abyad sphere and flattened/semi sphere shape standardisation. **(Top)** length vs. width comparison above and **(bottom)** length vs. height.

Figure 8.22: Example of diversity of cones *within* and across sub-type. **(Top)** selection of type 1 (round base, straight sides) cones from Sabi Abyad displaying a range of sizes and tip shapes. CO#s 267, 268, 269 and 270. **(Bottom left)** photograph of type-5 cone: CO# 191. The base is round, yet the sides flare to the base, defining this object is a type 5 cone. The cone is tall, with a rounded tip. **(Bottom right)** sketch of type 1 cone CO# 268. The base is again round, and the sides are straight (no flaring or pinching); defining this object as a type 1 cone. The tip is pointed. (Sketch and photographs: author's own).



(a) Tier 1 Tell Sabi Abyad cones: Sub-types combined (n=43)

(b) Type 1 cones (n=20)



(c) Type 2 cones (n=6)

d) Type 4 cones (n=15)

Figure 8.23: Tier 1 Tell Sabi Abyad cones: diversity of tip shape according to cone sub-type. **(a)** all tier 1 Tell Sabi Abyad cones combined (including the n=2 type 5 cones: flared sides), **(b)** type 1 cones (round base, straight sides), **(c)** type 2 cones (oval base, straight sides) and **(d)** type 4 cones (pinched sides).

Figure 8.24: CO# 309. This type 2 (flat base) disc from the tier 1 Tell Sabi Abyad collection has clear evidence of the manipulation of the clay objects with the fingers, and a flat surface (leaving impressions on the base) to create to final shape (left to right: top, section, base, detail of top). (Photograph: author's own).

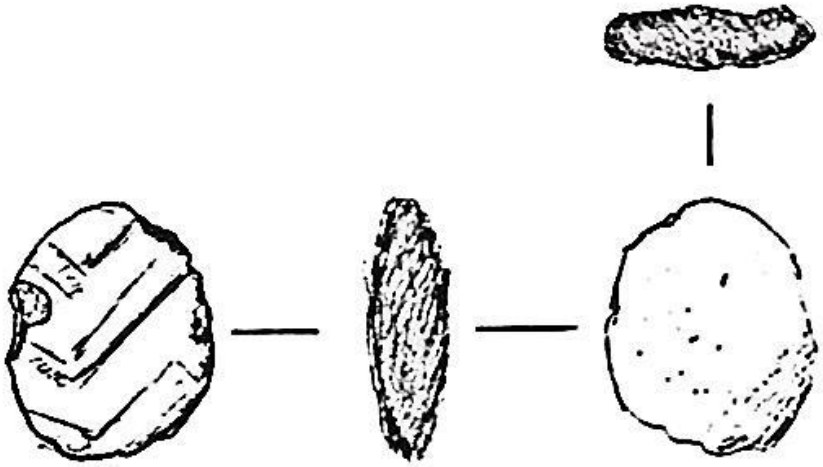


Figure 8.25: Tier 1 Tell Sabi Abyad clay objects with impressions. Example of a disc displaying clear matting impressions on the base. Sketch of CO# 331. (Sketch: author's own).

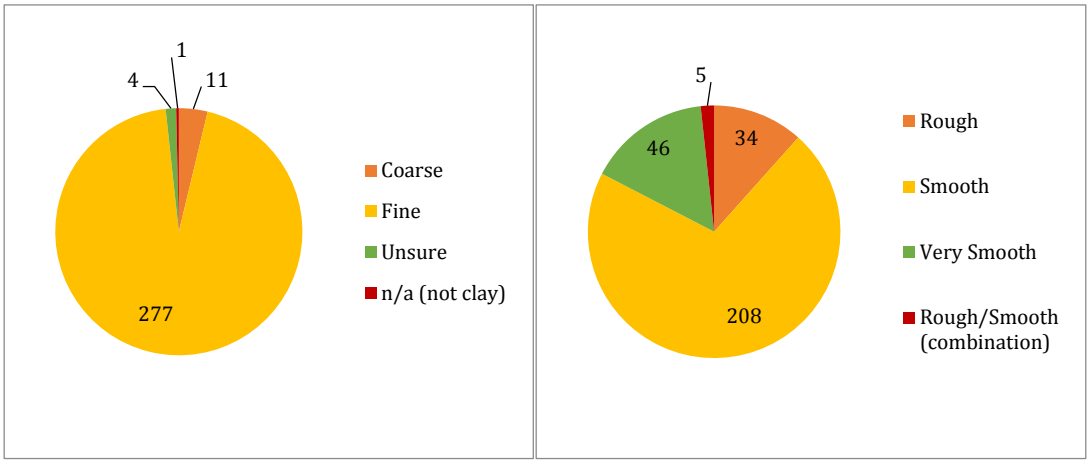


Figure 8.26: (Left) clay texture and **(right)** outer surface finish of all Tell Sabi Abad tier 1 (viewed) clay objects.

Figure 8.27: CO#239 miscellaneous shaped object with clear fingerprints on the top surface, where the fingers have been used to press the clay downwards in order to create the unusual shape. Left to right: top, top, section and base. Photographs: author's own).

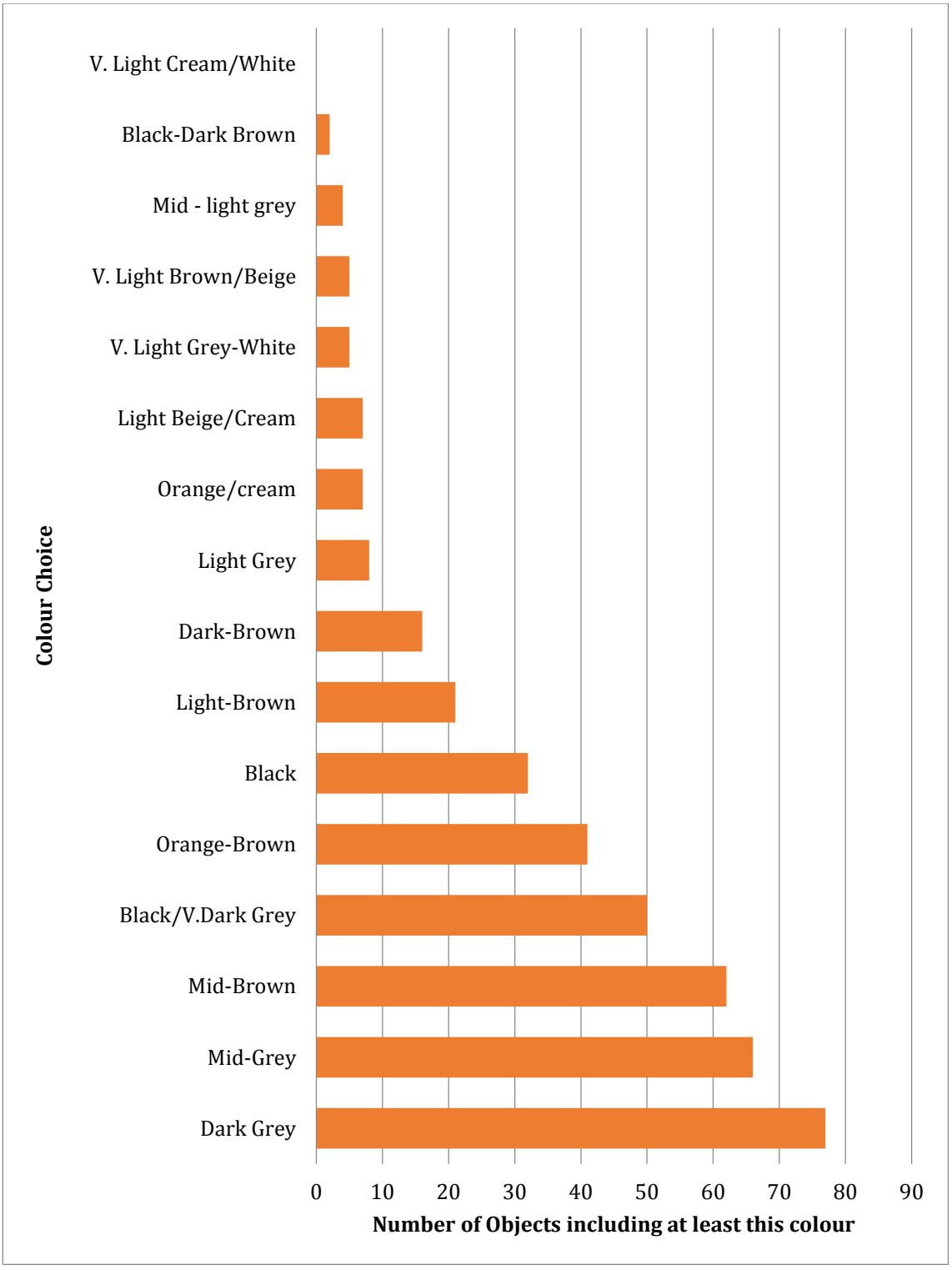


Figure 8.28: Object colour: the number of times each pre-set colour/colour shade was selected to describe an object within the Tell Sabi Abyad tier 1 assemblage.

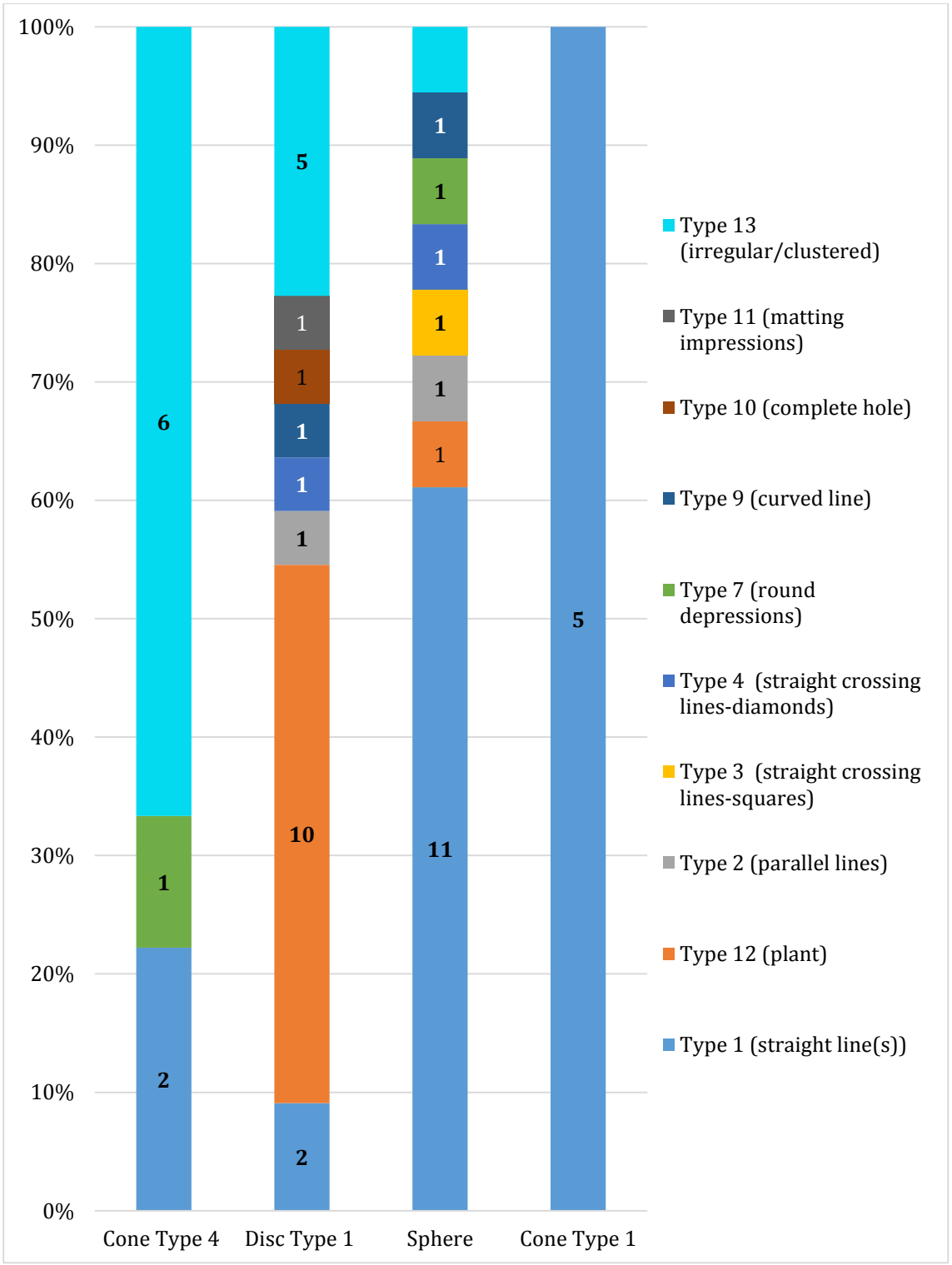


Figure 8.29: Tier 1 Tell Sabi Abyad clay objects; type of marking (as a proportion of each shape assemblage's marked objects according to a selection of three-dimensional shapes.

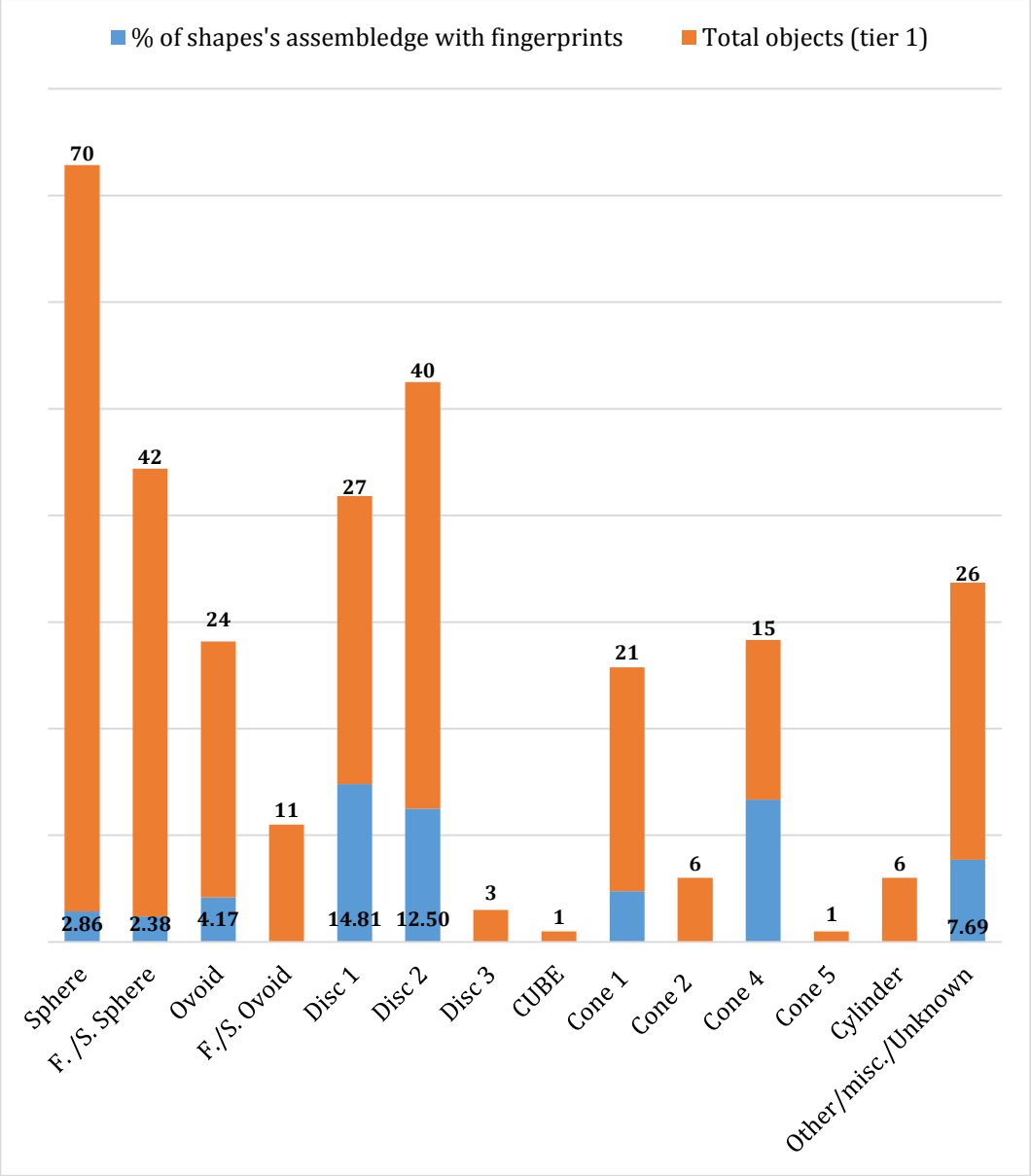


Figure 8.30: Fingerprint presence and visibility: the number of clay objects per shape compared to the proportion of objects within each shape with fingerprints visible.

Figure 8.31: Tell Sabi Abyad tier 1 notable clay objects: "anthropomorphic cones". Comparison of shapes as viewed from **(top)** section view, **(middle)** plan view and **(bottom)** longitude view. CO#s 130 **(top left** in each photograph), 114 **(bottom left** in each photograph), 137 **(top right** in each photograph) and 109 **(bottom right** in each photograph). (Photograph: author's own).

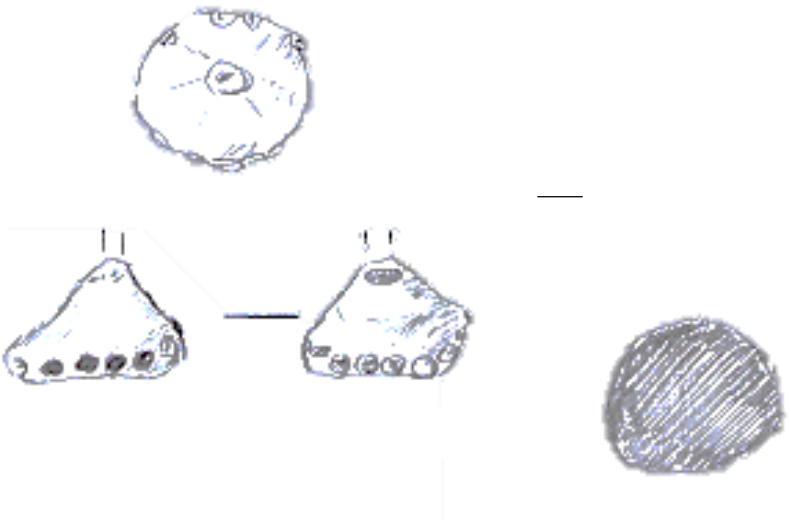


Figure 8.32: Tell Sabi Abyad tier 1 notable clay objects: "anthropomorphic cones". Photograph of the detail of CO# 114, and sketch of the object in various positions. This example highlights applied decoration in the form of tiny circles of clay, each incised across the centre. (Sketch and photograph: author's own).

Figure 8.33: Tier 1 Tell Sabi Abyad notable clay objects, larger discs with plant impressions. **(Top)** CO# 297; type 2 disc covered on both the flat base and convex top surface with impressions of plants or other unidentified dense impressions. Left: top, centre: section view**,** right: base. **(Middle)** warped larger disc shaped object. Both sides slightly convex and with plant impressions. CO# 322 Left: top, centre: section view, right: base. **(Bottom)** CO# 278. Type 1 disc with extensive plant impressions covering the entire convex upper surface; left to right, base, top, section and longitude views. (Photographs: author's own).

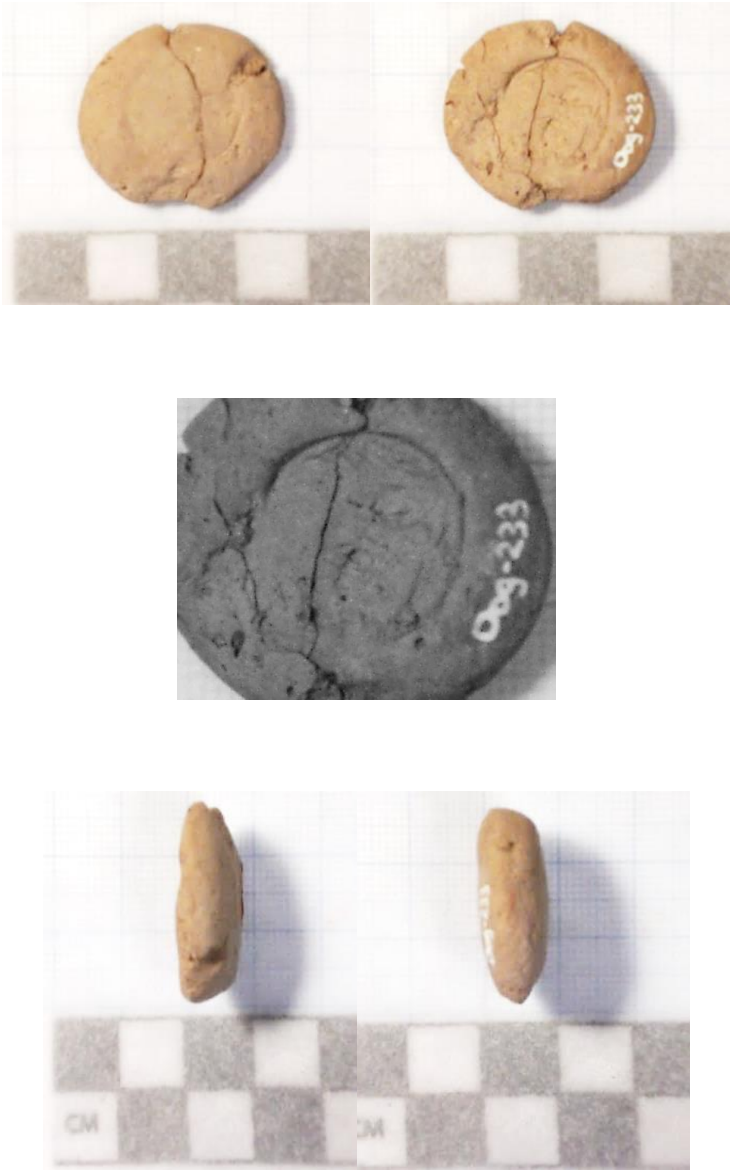


Figure 8.34: Disc CO# 105. Stamped on both sides. Tell Sabi Abyad tier 1 collection. **(Top)** front and reverse sides. **(Middle)** front side in black and white with detail of impression. **(Bottom)** section and longitude view. (Photograph: author's own).

Figure 8.35: (Top) photograph of semi-spherical object CO# 287 (tier 1 Tell Sabi Abyad) with probable stamp seal impression on the base: impressions-possile stamp seal on the base: **(left)** plan view and **(right)** base. (Photograph: author's own). **(Bottom)** comparative clay objects: **(Left)** CO# 2874, type 1 cone from Tell Sabi Abyad (tier 2) (Akkermans 1996b: fig 8.2.25 p. 465), **(right)** clay stamp seal from Neolithic Catalhoyuk (Mellaart 1967: fig. 56 p. 220).

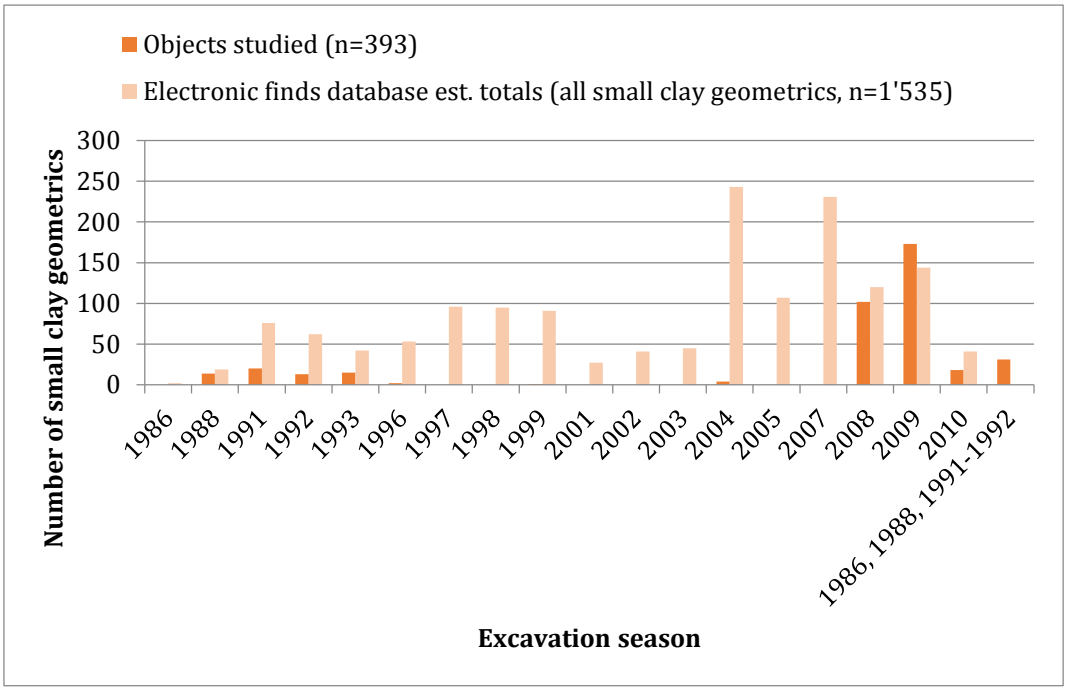


Figure 8.36: Distribution of the studied (tiers 1 and 2) geometric clay object assemblage from Tell Sabi Abyad (n=393) by excavation season, compared to the overall total number of "tokens" and other relevant artefact categories (see table 8.1-1) recorded on site and detailed in Tell Sabi Abyad's electronic object list (or "box files").

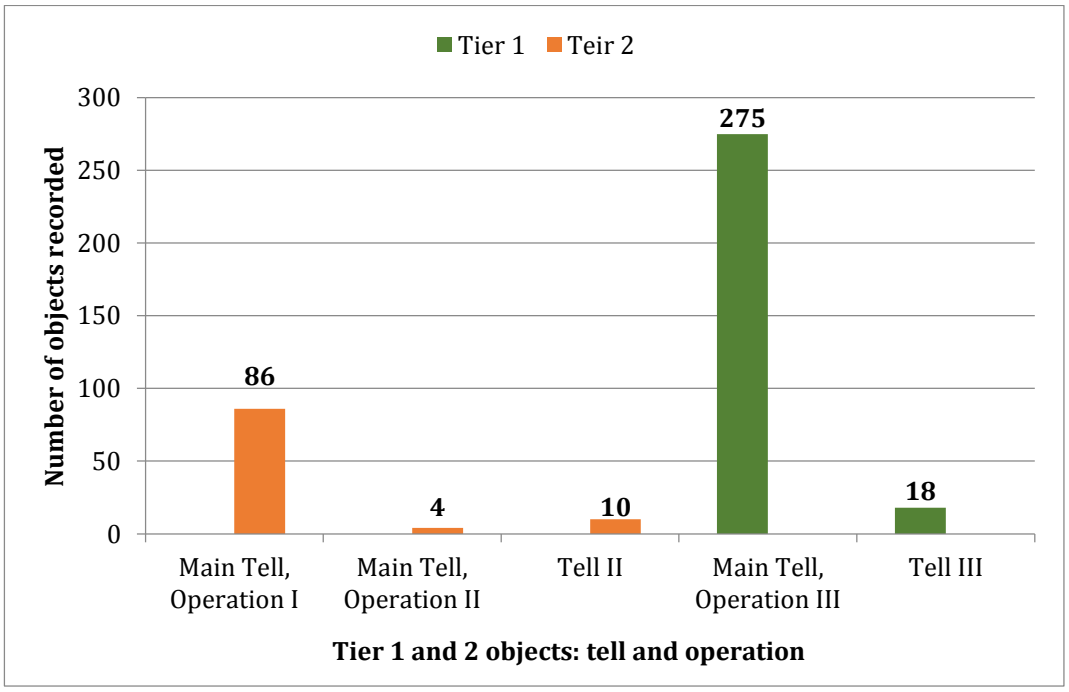


Figure 8.37: Objects recorded by mound (including operation for main tell areas): tier 1 (objects viewed in person) and tier 2: clay objects recorded from illustrations in publications (Akkermans & Verhoeven 1995; Akkermans 1996b and Verhoeven & Akkermans 2000) and from site records (4 objects only).

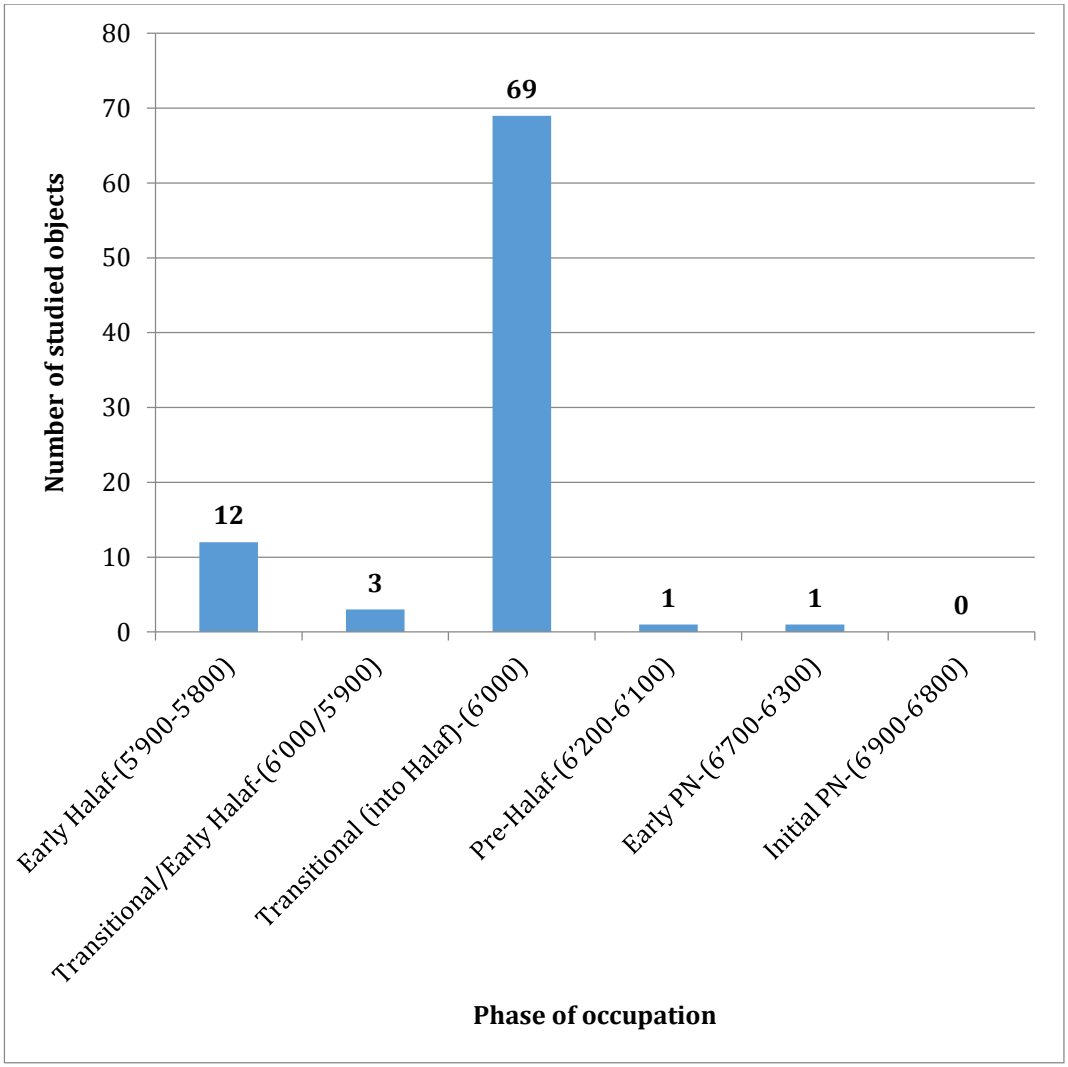
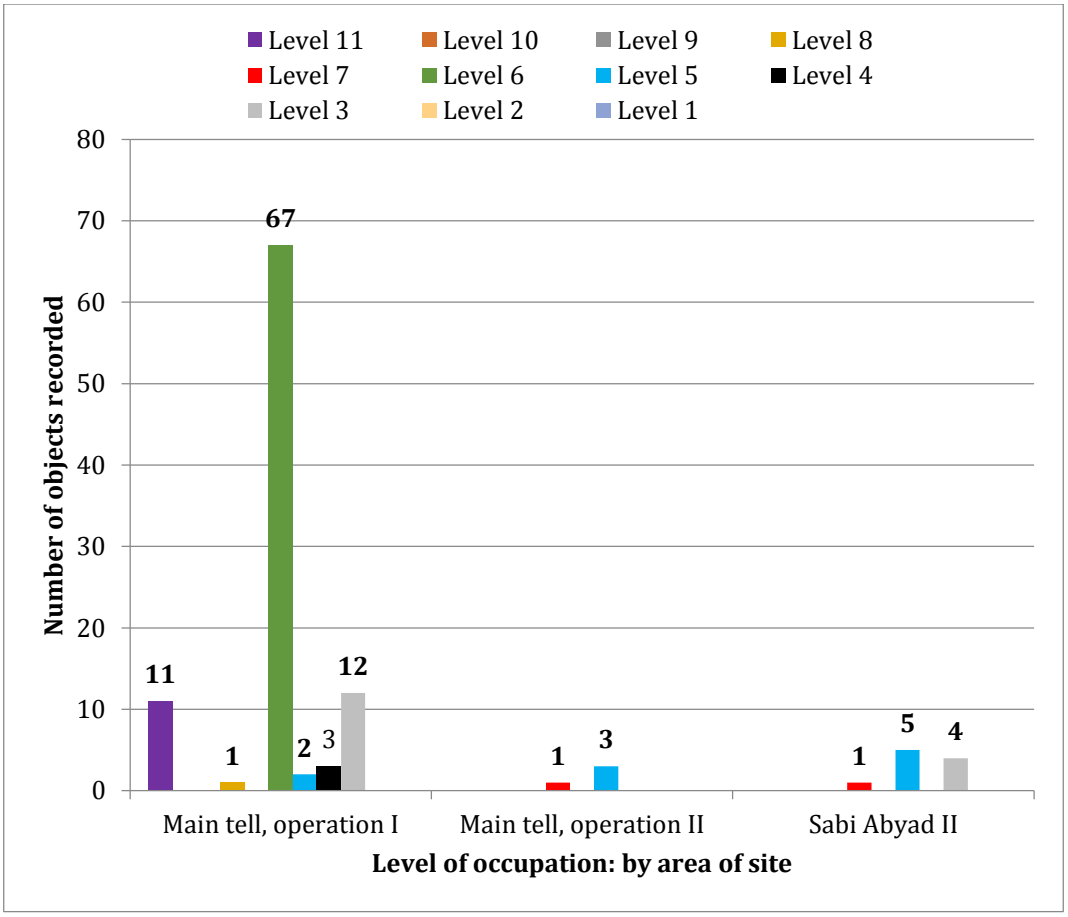


Figure 8.38: Temporal distribution of all 86 clay objects recorded (all at tier 2 level) from operation I, Tell Sabi Abyad (main tell).



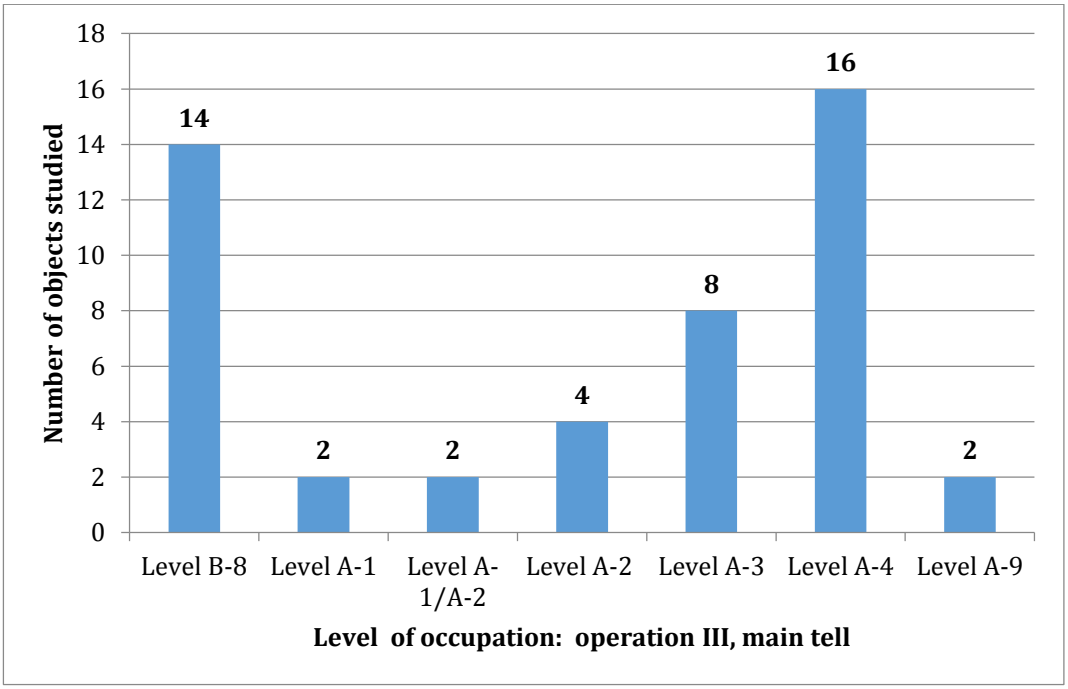


Figure 8.39: Level of occupation by area of site: Tell Sabi Abyad (tiers 1 and 2 combined). **(Top)** detail of the number of recorded clay objects within each stratigraphic layer within each distinct site area; operations I and II on the main tell, and Sabi Abyad II. **(Bottom)** number of clay objects recorded from specific occupational levels within operation III (main tell). Youngest levels (B8) are on the left, oldest are on the right (A-9).

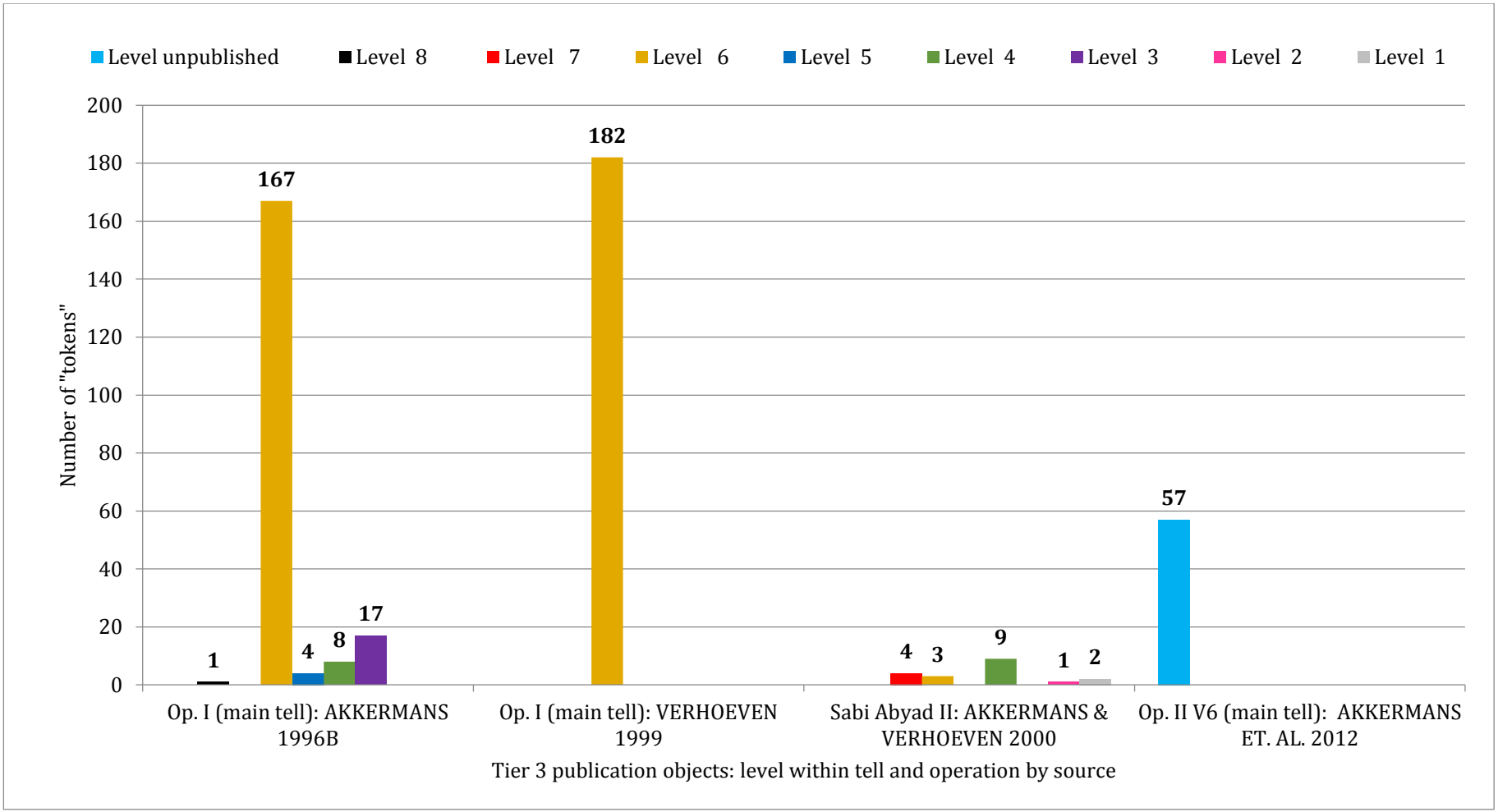


Figure 8.40: Detail of the n=273 tier 3 ("token" totals from passing references only) publication sources arranged by source, area of site and level within area. See table 8.3 also.

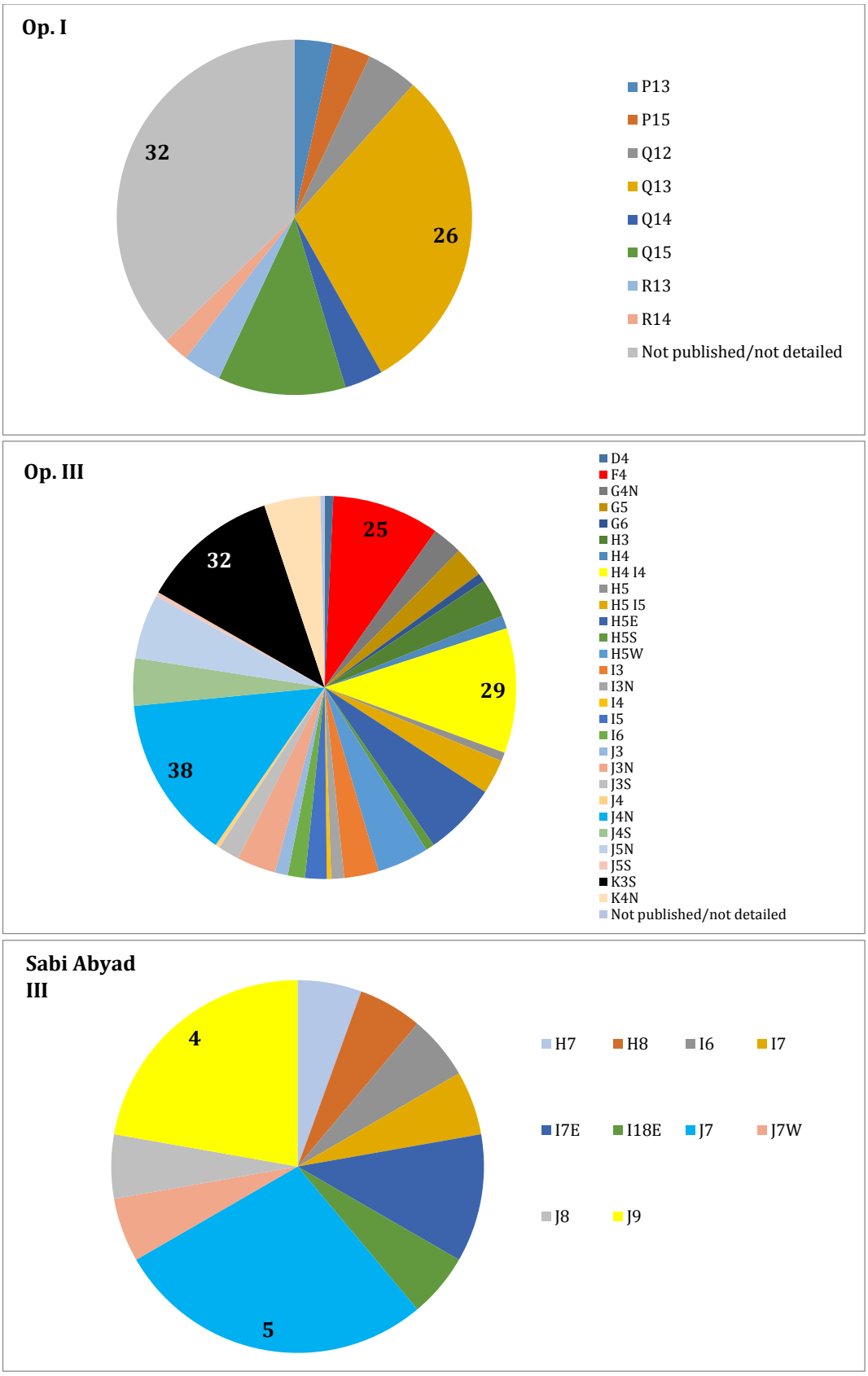


Figure 8.41: horizontal distribution of studied small geometric clay objects from Tell Sabi Abyad according to area of site, and 10 m^2 excavation squares within each. **(Top)** Operation I, main tell, **(middle)** Operation III, main tell and **(bottom)** Sabi Abyad III.

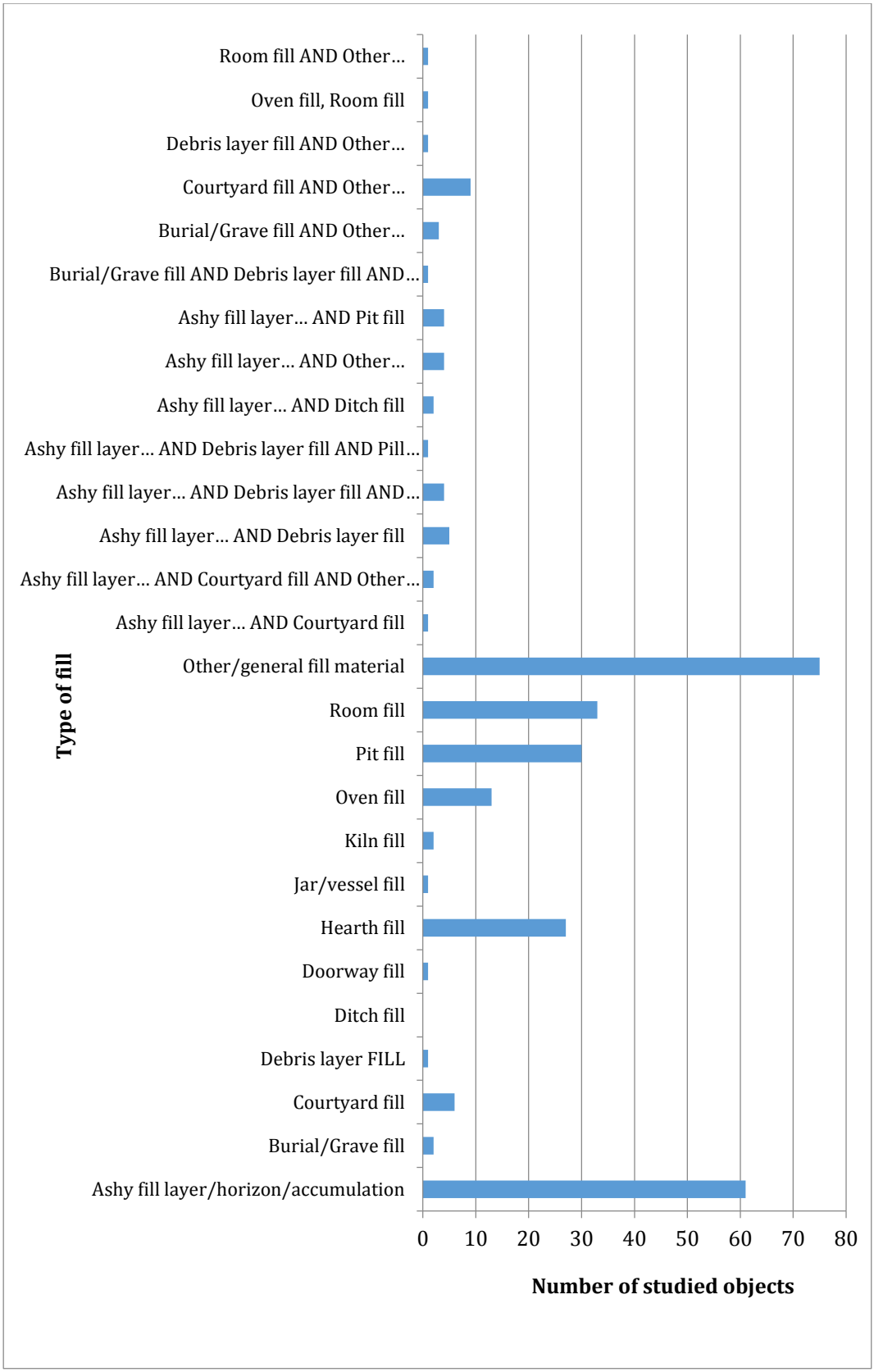


Figure 8.42: Detail of the n=291 studied clay objects which come from "fill" context types.

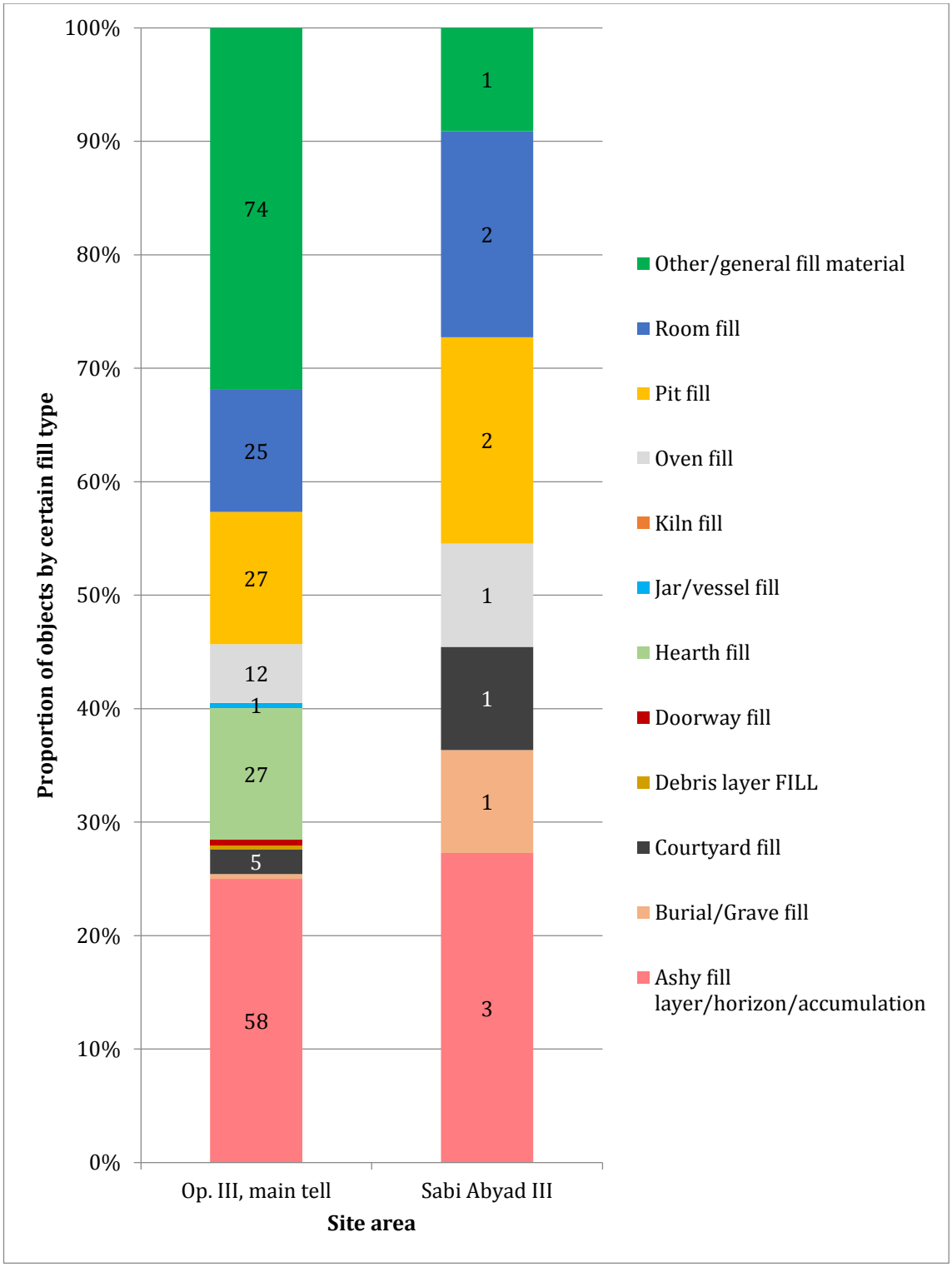


Figure 8.43: Comparative detail of the singular (certain) fill types of the clay objects studied from operation III and Sabi Abyad III.

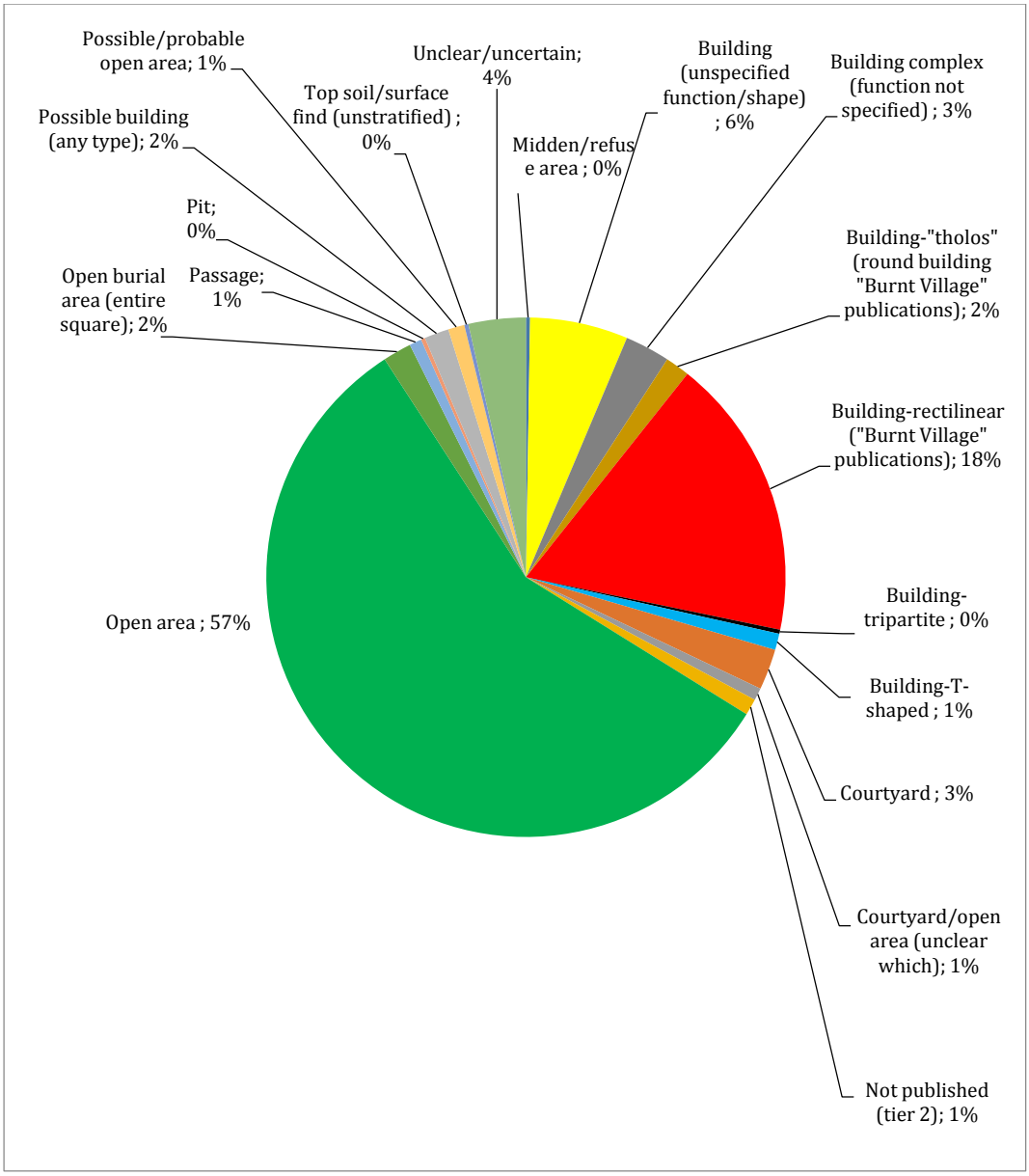
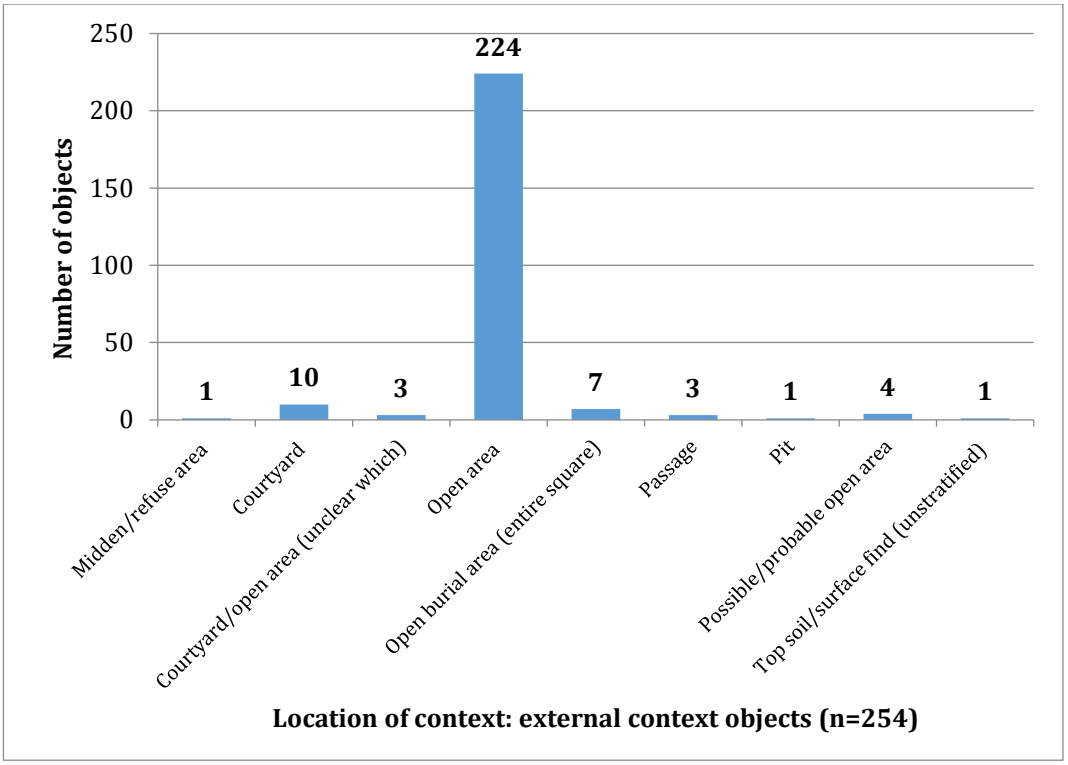


Figure 8.44: Detail of the *Location of Context*: the broad area in which the fill or structural material in which the geometrics were found at Tell Sabi Abyad.



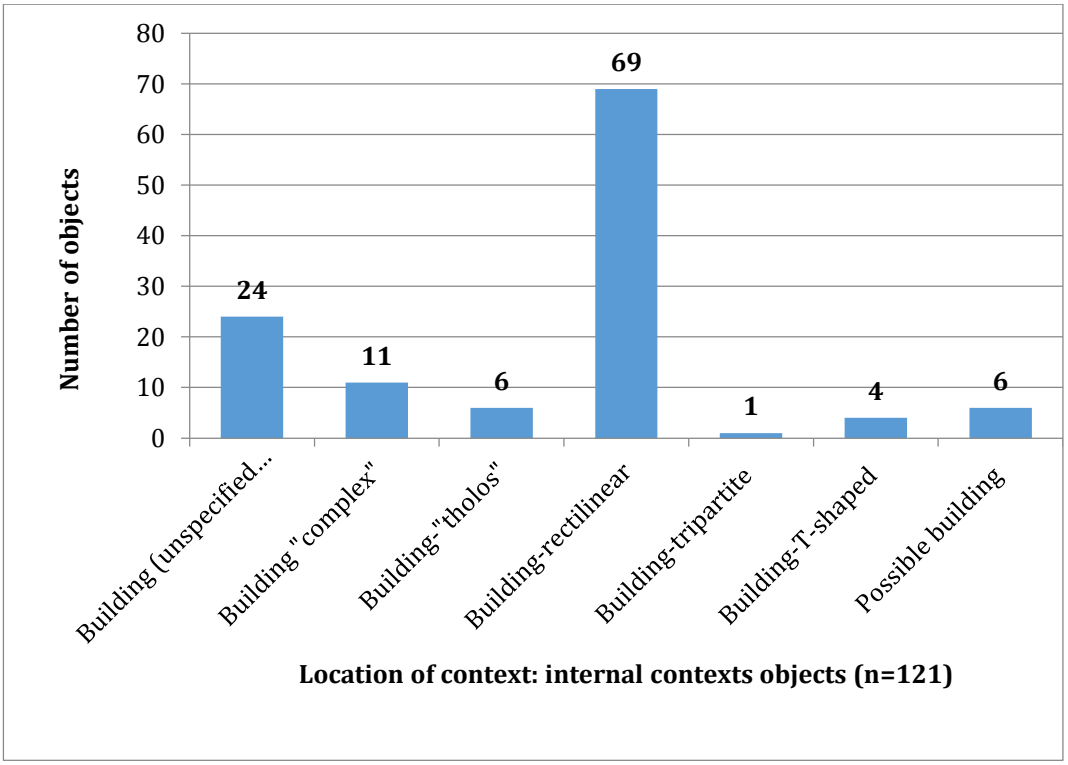


Figure 8.45: Comparison of the "location of context" and number of small geometric clay objects recovered from each. **(Top)** external contexts compared to **(bottom)** internal contexts.

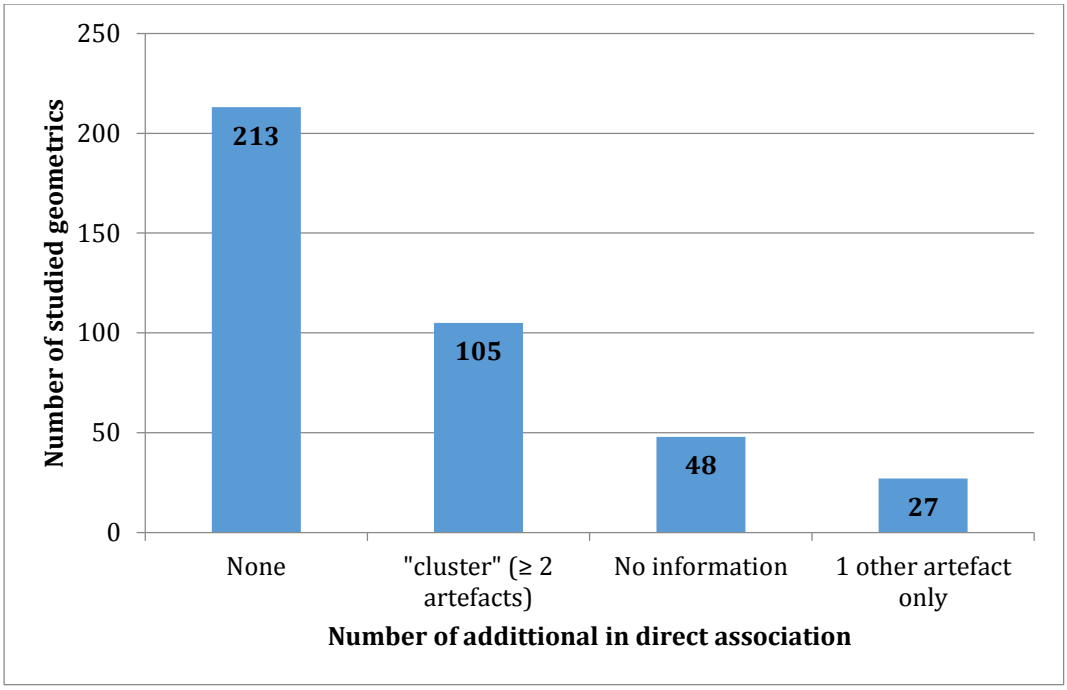


Figure 8.46: The number of studied geometric clay objects recovered from a context where other artefact(s) were found in direct association.

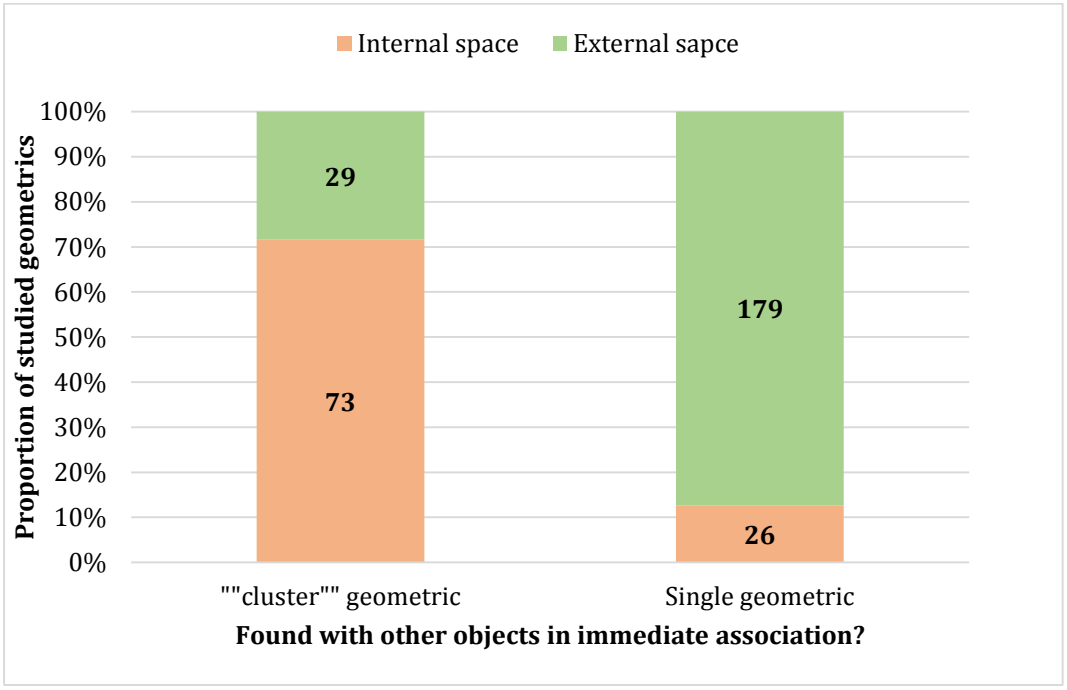


Figure 8.47: Comparison of the number and proportion of the "cluster" (geometrics recovered with at least two additional artefacts in direct association) and single geometric clay objects within internal and external spaces at Tell Sabi Abyad.

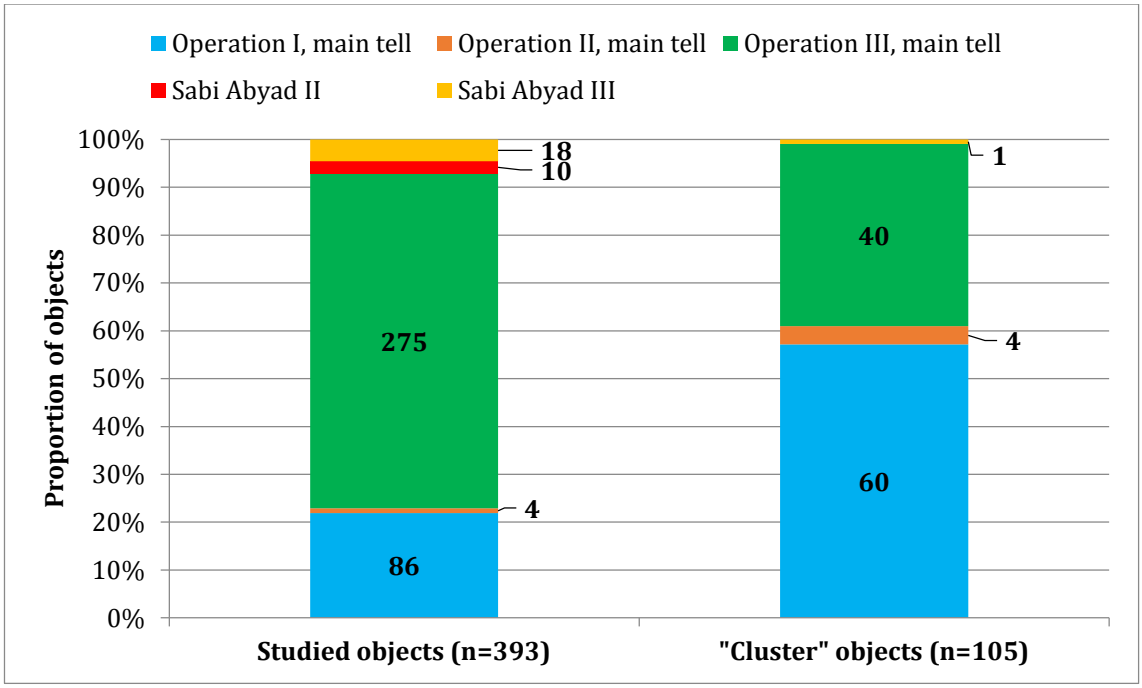


Figure 8.48: Proportion of all studied clay objects compared to objects recovered from a cluster (context with 2 or more additional artefacts found in direct association) according to excavation area.

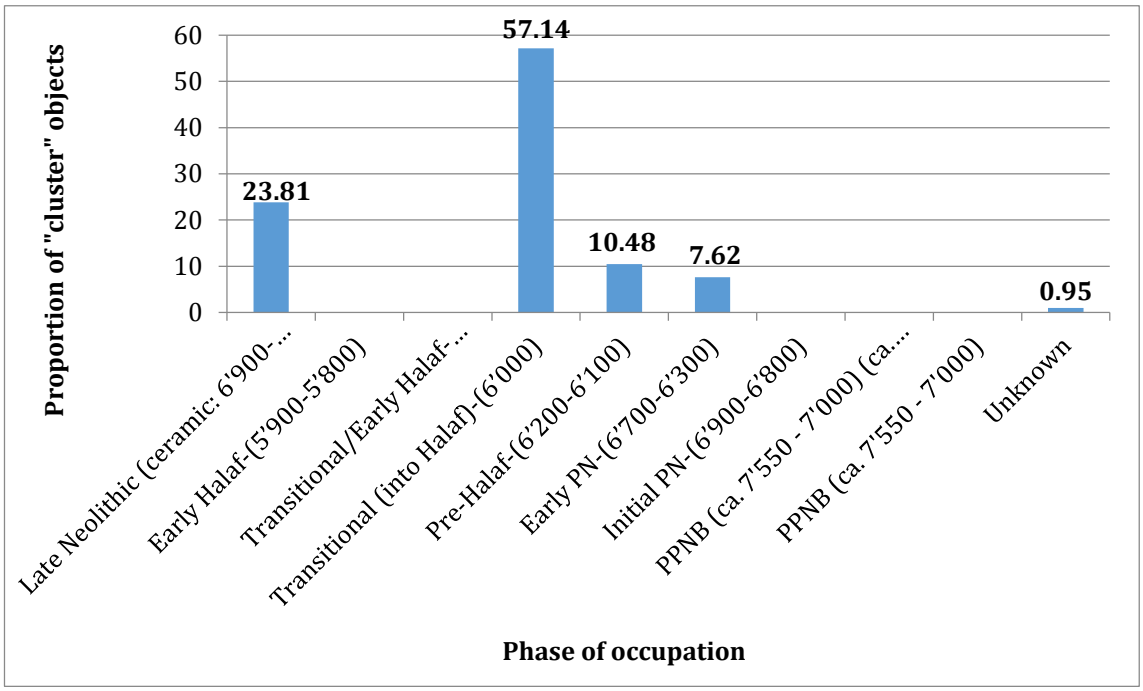


Figure 8.49: Temporal distribution of the n=105 "cluster" clay objects by cultural phase (as published by Nieuwenhuyse *et al.* 2010: fig. 5 p. 78). The number pre phase can be seen on the vertical axis. The number of objects as a percentage of cluster objects is marked on each bar.

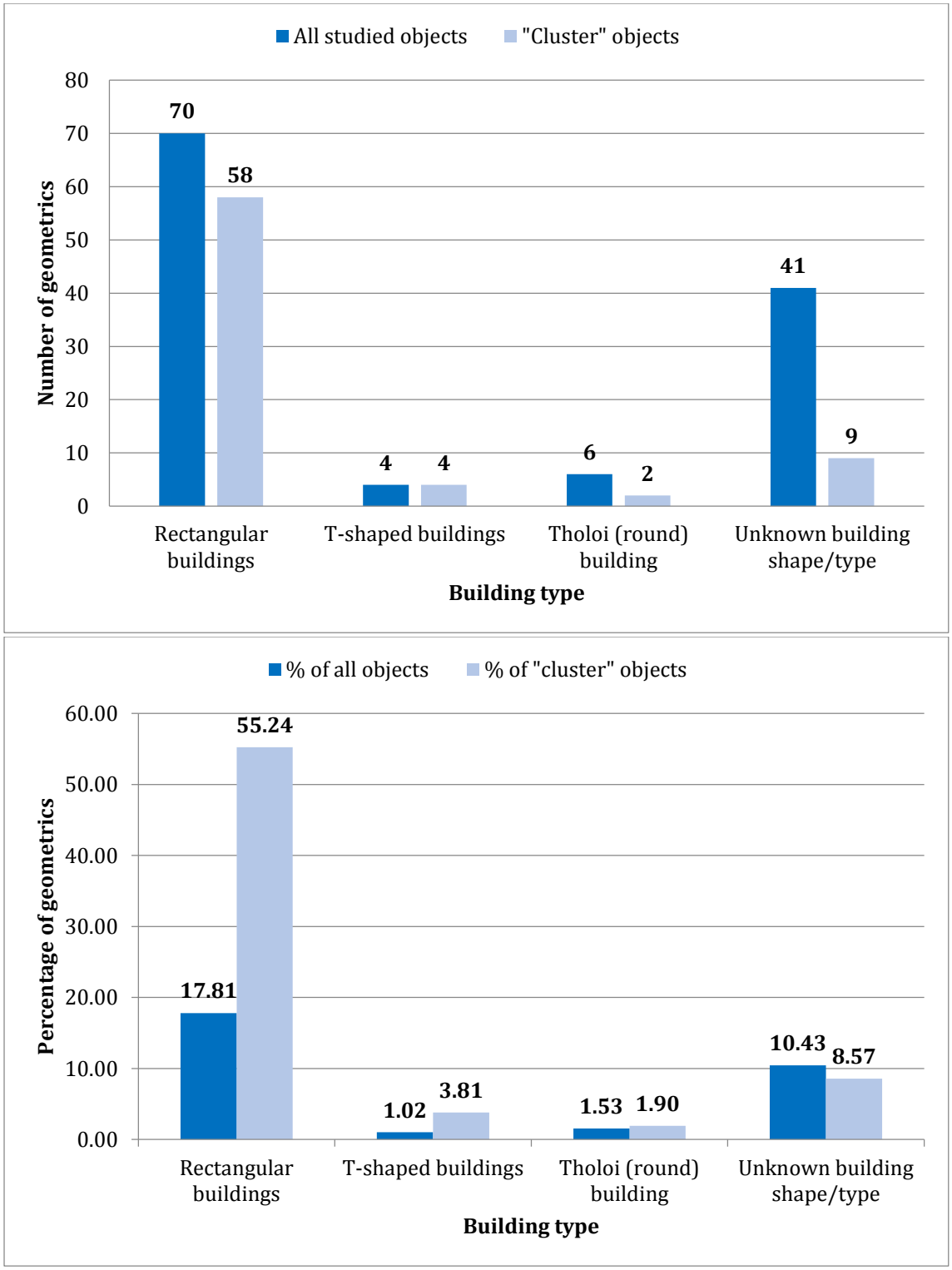


Figure 8.50: Comparison of the building shape of those geometric clay objects recovered from buildings by building type: all studied objects compared to those recovered as a cluster only. **(Top)** number of studied and "cluster" clay objects by building type. **(Bottom)** distribution of all and "cluster" objects as a percentage of each assemblage's total.

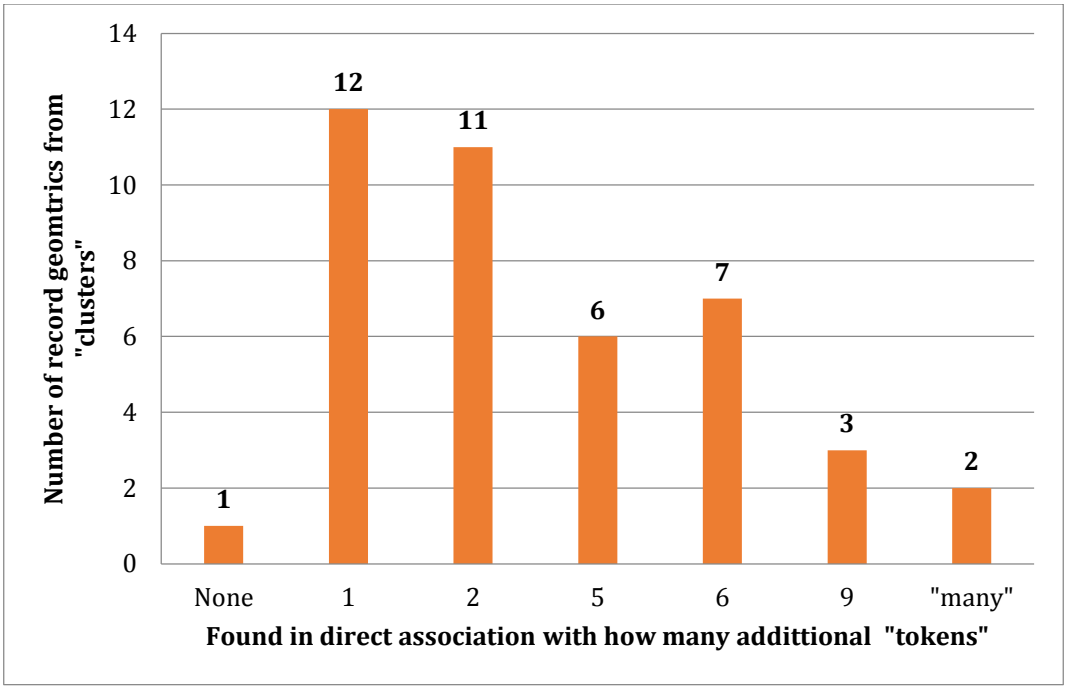


Figure 8.51: Number of "cluster" clay objects found in direct association with at least one other "token".

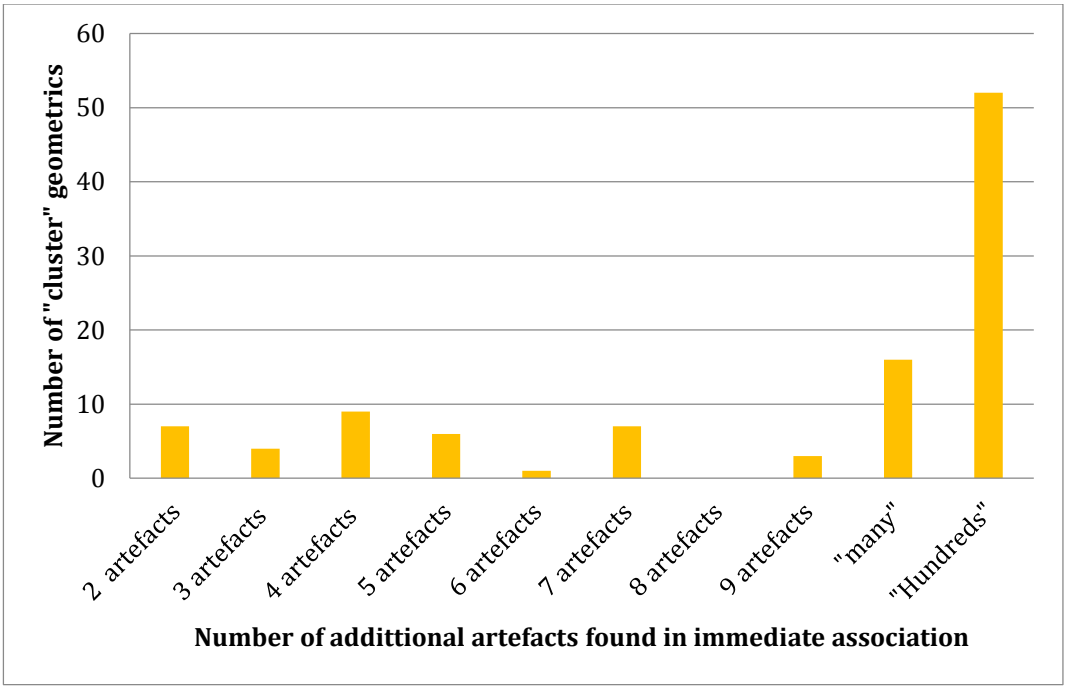


Figure 8.52: Number of "cluster" clay objects found in direct association with other artefacts.

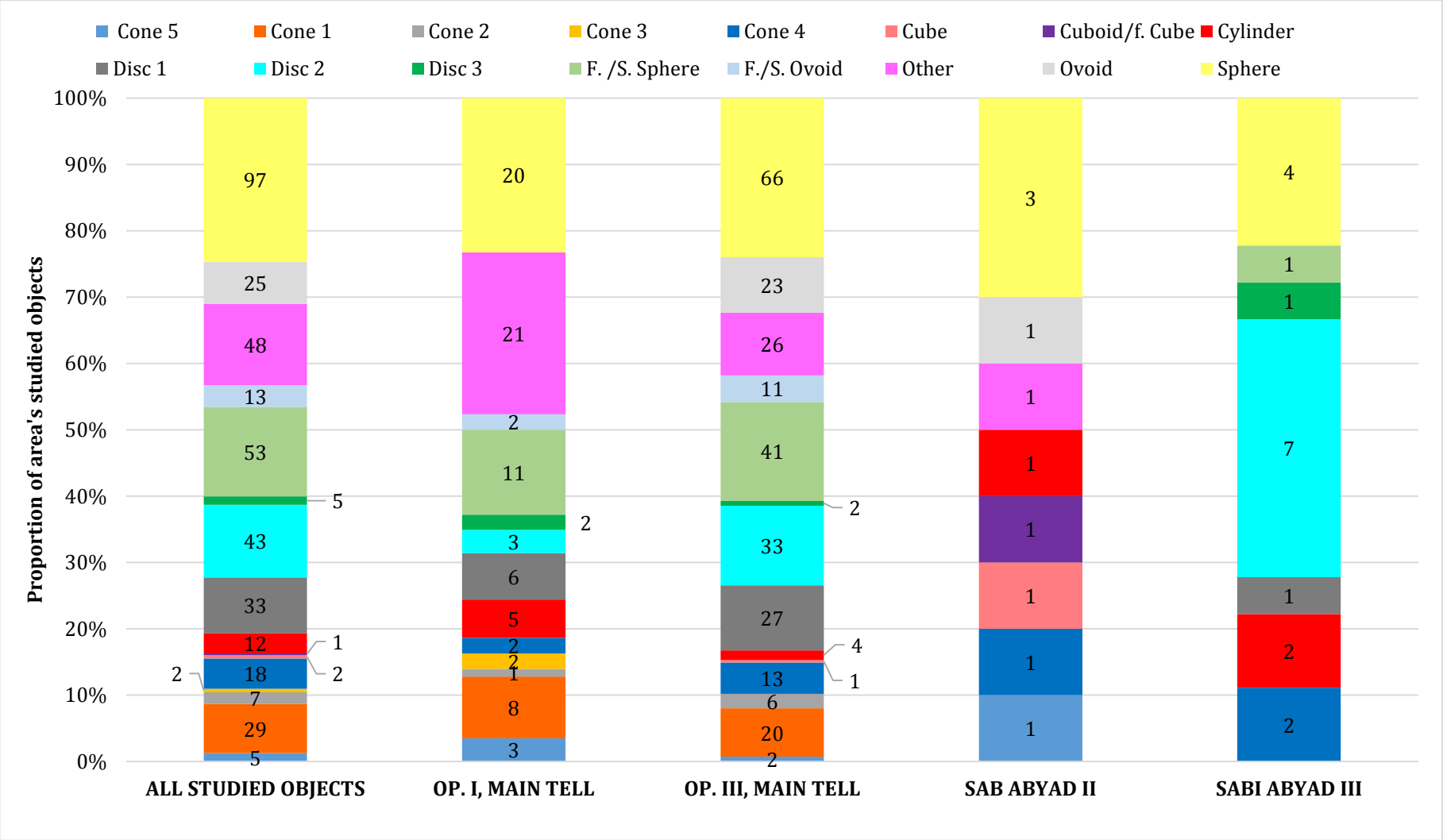


Figure 8.53: Distribution of studied geometric clay objects across different excavated areas of the site (excluding operation II, square V6; n=4 objects) by three-dimensional shape.

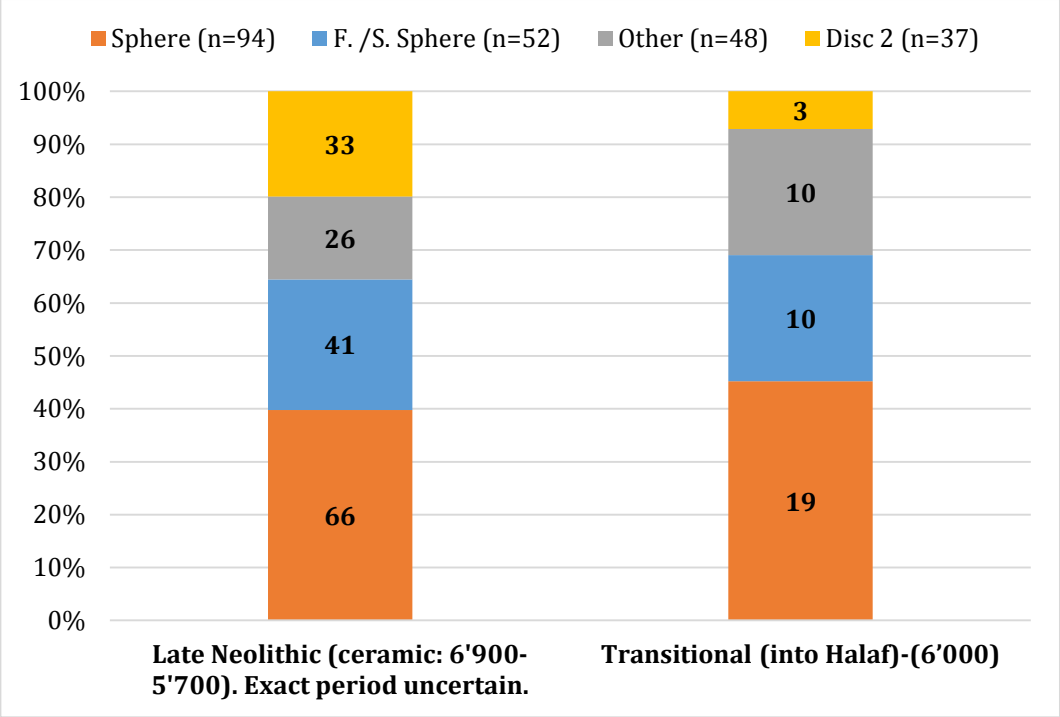


Figure 8.54: Comparison of the proportion of studied objects by three-dimensional shapes (the most common shapes only) across two occupational phases: the broad Late Neolithic (objects with no detail phase available) and the Transitional Halaf specifically. The actual number of objects of each shape per phase is marked on the bars.

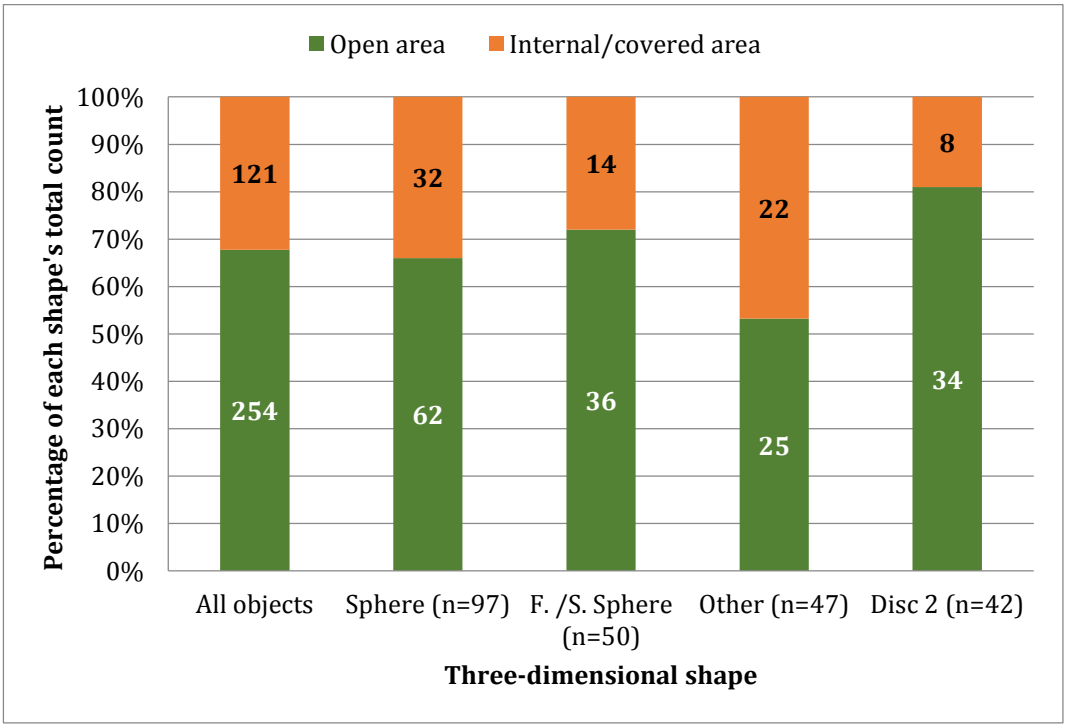


Figure 8.55: Location of the context of studied clay objects: all objects compared to objects by specific three-dimensional shape. The number of each shape's total count recovered from "internal" and "external" contexts is detailed.

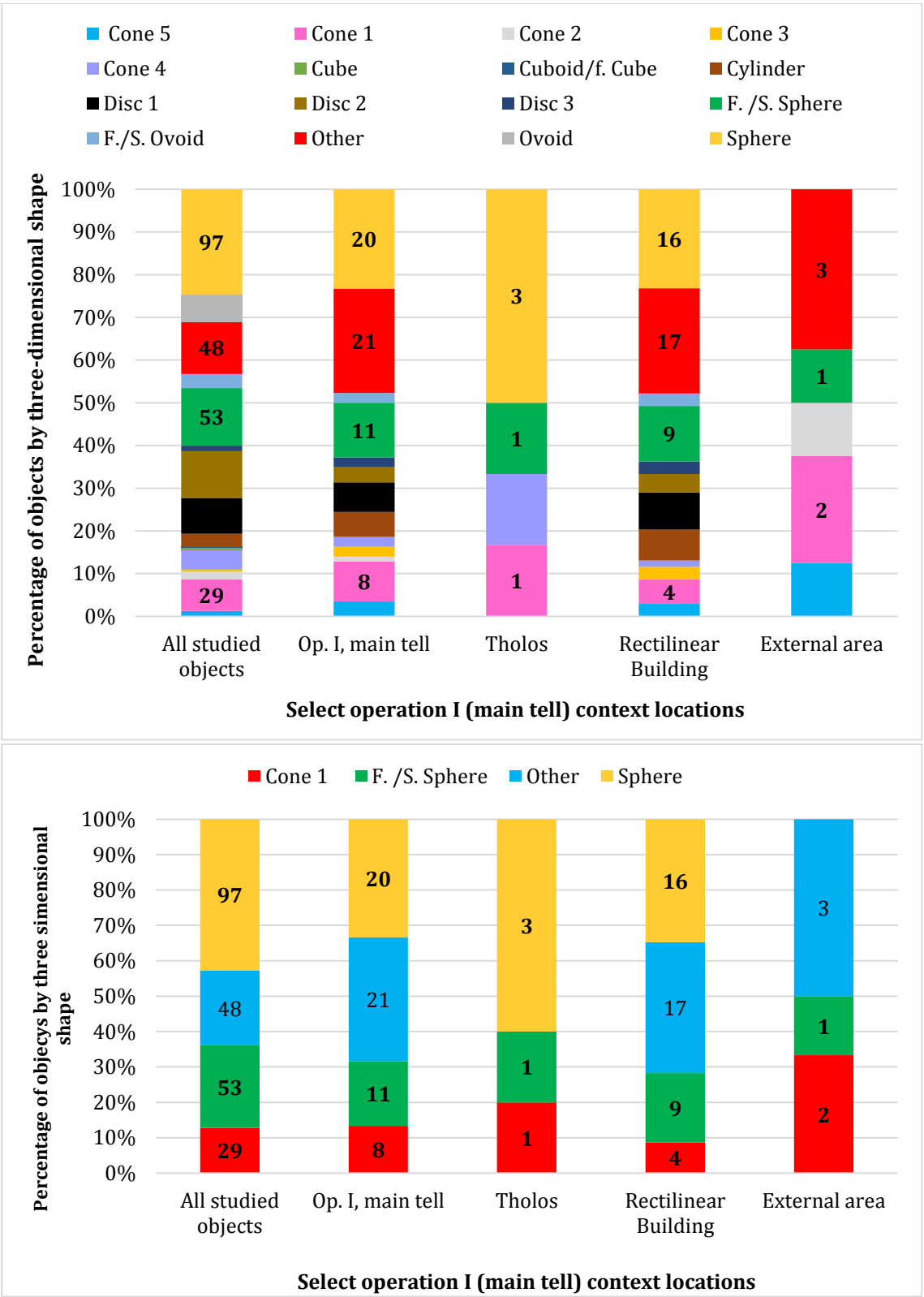


Figure 8.56a: Distribution of geometric clay objects by three-dimensional shape. All Tell Sabi Abyad objects (n=393), contrasted to those from operation I (main tell) (n=86), and within operation I according to context type: tholos, rectilinear building and external spaces. **(Top)** detailed shape categories and **(bottom)** selected shapes only. The proportion is depicted by the blocks, whilst the actual count is numbered on each.

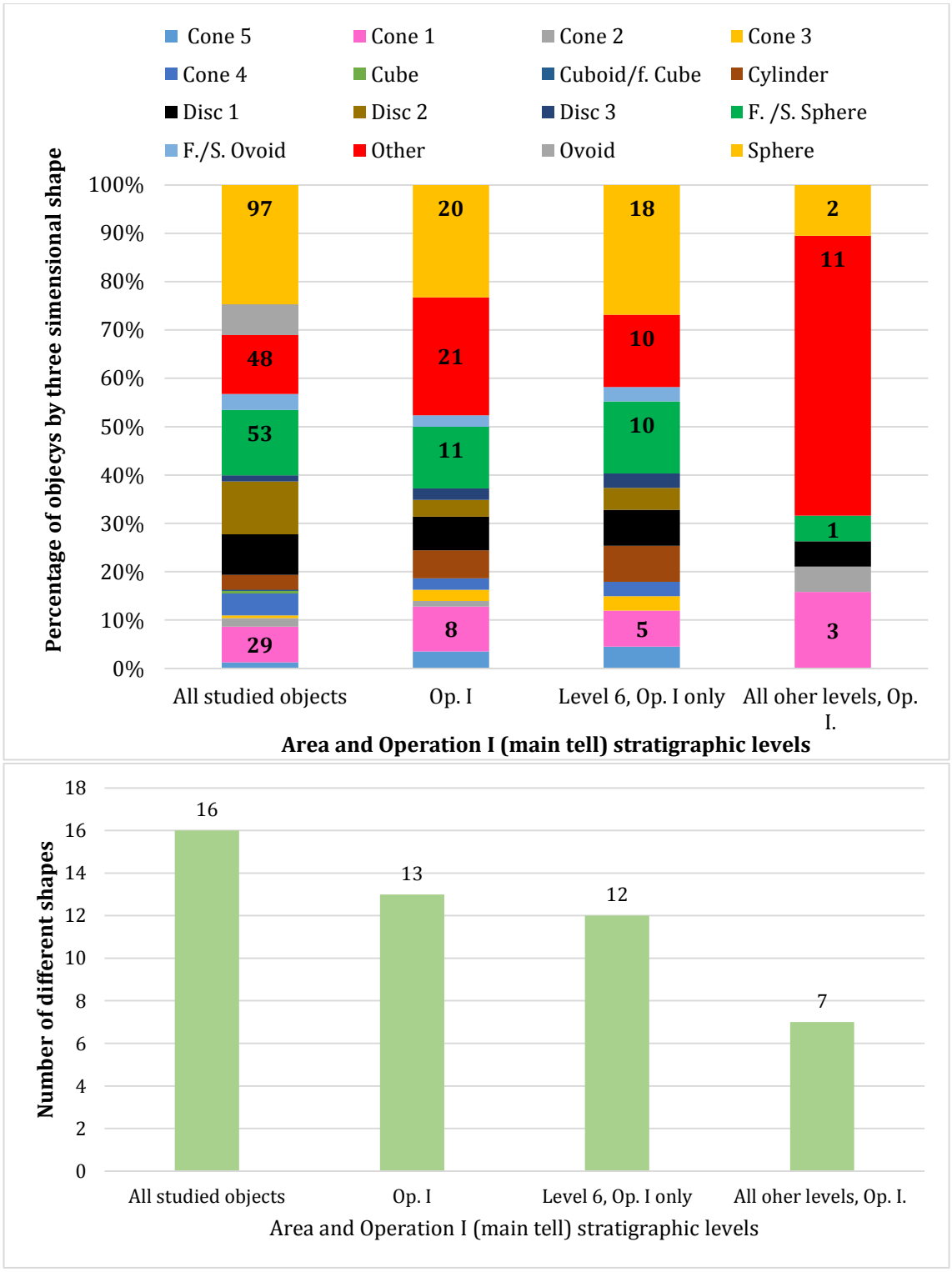


Figure 8.56b: Distribution of geometric clay objects by three-dimensional shape. All Tell Sabi Abyad objects (n=393), contrasted to those from operation I (main tell) (n=86), and within operation I according to phase of occupation; Level 6 (n=69) and all other levels within operation I. **(Top)** detailed shape categories and **(bottom)** total number of different detailed shapes present. The proportion is depicted by the blocks, whilst the actual count is numbered on each.

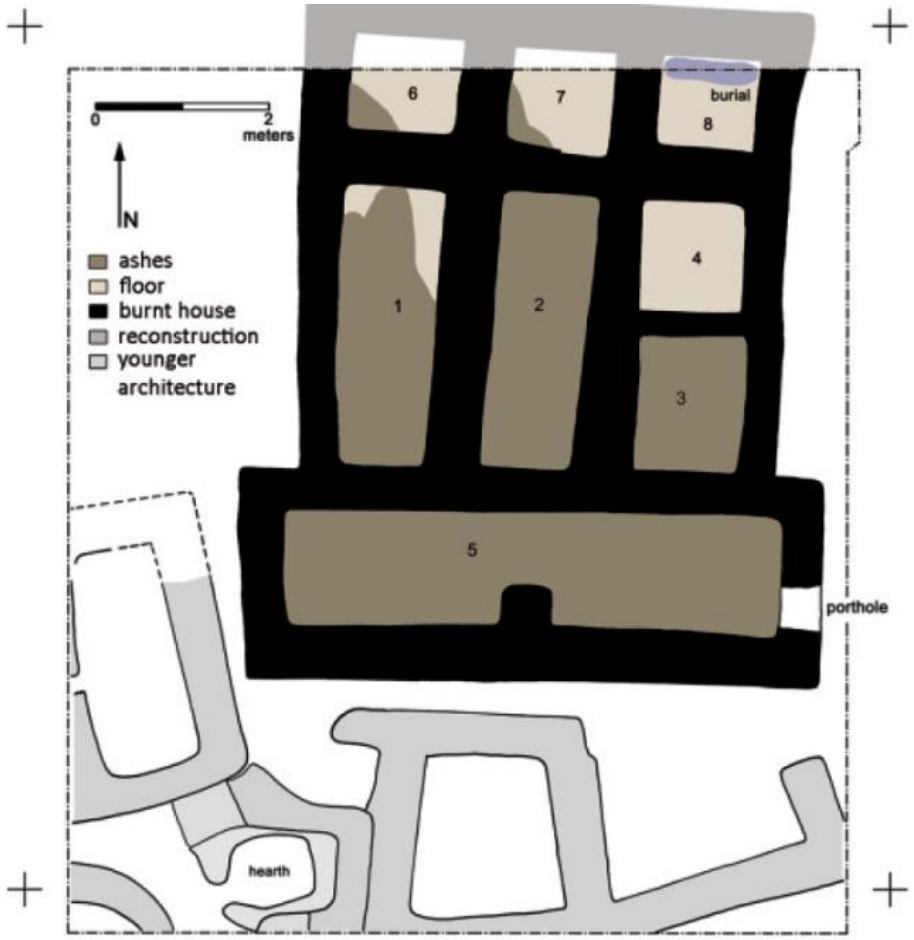


Figure 8.57: Excavation square V6 showing location of building I; covering most of the square. The 4 "bullae" (CO#s 2915-18) were recovered from room 3. (Akkermans *et al.* 2012: fig. 4 p. 312).

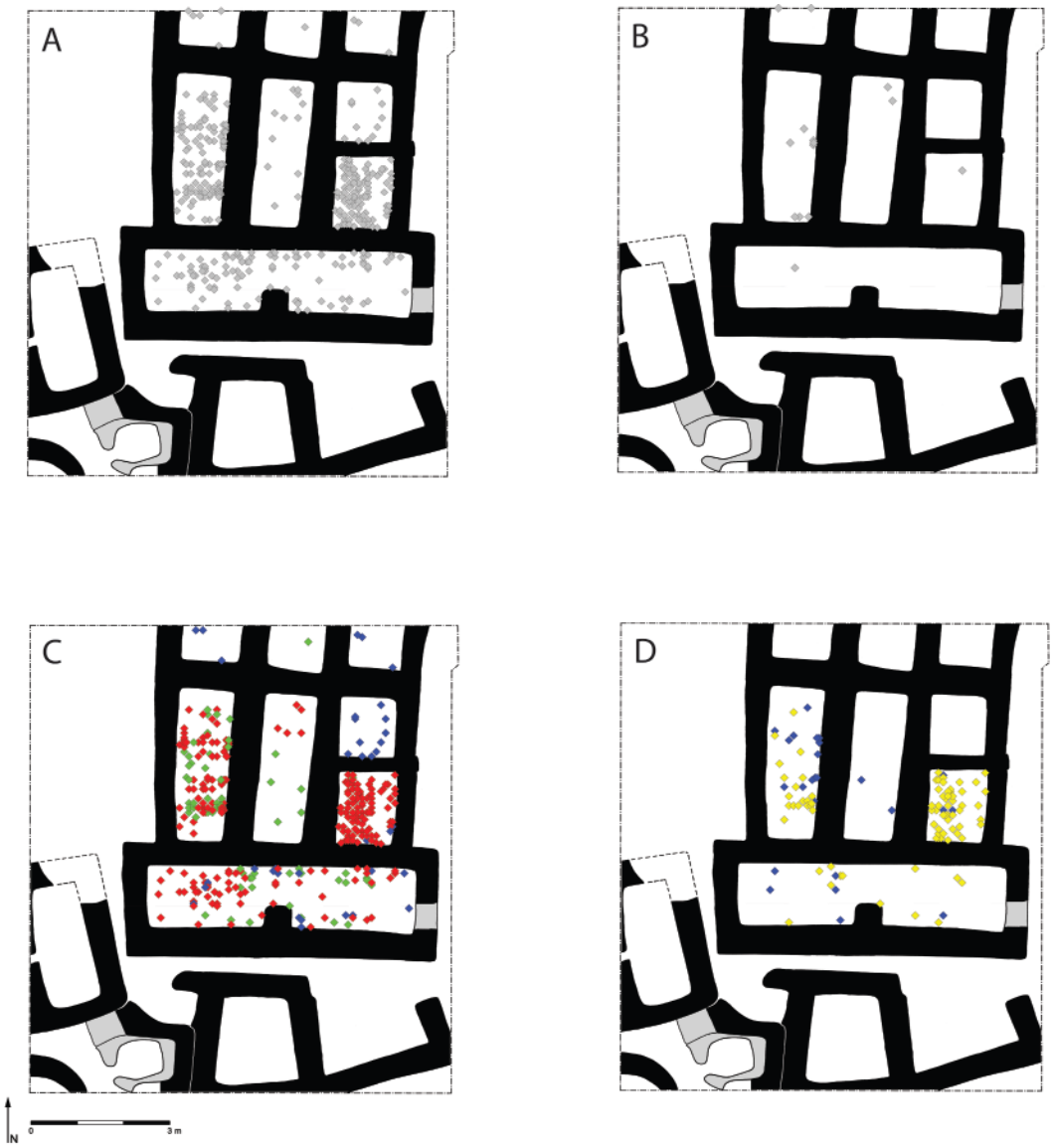


Figure 8.58: Location (floor surface or room fill) and distribution by room of the small finds recovered from the burnt building I, V6. The four "bullae" from room 3 are referred to as "sealings"). Room 3 where the four bullae were located is on the far right, the first cell above the wide room at the bottom of building I, the room densest in yellow icons ("sealings" and "tokens"). **(a)** all objects, **(b)** "floor surface" objects, **(c)** objects located in black ash (red), red-burnt (green) and unburnt (blue) debris and **(d) "**pierced discs" and "spindle whorls" (blue) compared to "tokens" and "jar stoppers" (yellow)**.** (Akkermans *et al.* 2012: fig. 10 p. 319).

TABLES

DESIGNATION	1986	1988	1991	1992	1993	1996	1997	1998	1999	2001	2002	2003	2004	2005	2007	2008	2009	2010	ALL SEASONS
Ball	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	3
Bulla	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4
Lump / Lumps / Lump (token)/Fingerprint	0	0	0	0	0	0	16	27	25	0	5	12	72	0	47	0	5	0	209
Shaped clay	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	23
Clay Object	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	29
Unknown (clay artefact)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Miniature bowl	0	3	7	1	0	2	0	0	1	0	6	0	1	3	0	1	0	0	25
Miniature jar	2	2	0	3	1	2	0	0	1	0	0	0	0	0	2	0	0	0	13
Miniature vessel	0	0	0	0	0	0	0	0	0	1	0	1	5	1	4	0	0	0	12
Tally?	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Token / Token?	**0**	**14**	**69**	**58**	**40**	**49**	**80**	**67**	**64**	**25**	**30**	**32**	**157**	**66**	**168**	**112**	**137**	**9**	**1,177**
Token/labret	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	1	0	9
Token / sling missile	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Token / figurine	0	0	0	0	0	0	0	0	0	0	0	0	1	11	7	5	1	0	25
TOTAL	2	19	76	62	42	53	96	95	91	27	41	45	243	107	231	120	144	41	1,535

Table 8.1: Estimated total number of recovered clay geometrics at Tell Sabi Abyad. Simplified version of the Tell Sabi Abyad digitised small finds database ("Box files", TSAEP 1988-2010). Number of relevant small geometric clay objects, Neolithic objects only, filtered by object designation, size (objects <5cm only), raw material (clay objects only) and separated by excavation season. This data source forms part of the tier 3 data, along with generalised published references to groups of "tokens".

SOURCE	CHAPTER	TOTAL NUMBER OF SEALINGS REFERRED TO:	SEALING DESCRIPTION AND DISCUSSION	NUMBER ILLUSTRATED	ILLUSTRATION REFERENCE	CONTEXT
Akkermans, P. & Verhoeven, M. 1995, "An Image of Complexity: The burnt Village at Late Neolithic Sabi Abyad, Syria", American Journal of Archaeology, vol. 99, no. 1, pp. 5-32	n/a	275	See article in general.	n=16 stamped sealings	Fig 11.1-14, p. 22; fig. 12, p. 23 and fig. 13, p. 23.	Main Tell, operation I. Level 6 "Burnt Village" c. 6,000 cal. BC.
Akkermans, P. M. M. G. (Ed.) 1996b, Tell Sabi Abyad the Late Neolithic Settlement: Report on the Excavations of the University of Amsterdam (1988) and the National Museum of Antiquities Leiden (1991-1993) in Syria Volume II, Nederlands Historisch-Archaeologisch Instituut te Istanbul: Istanbul.	Volume II, Chapter 5: *"The Seals and Sealings" Kim* Duistermaat pp. 339-402.	131	Stamp seals: pp. 339-41. Also described in the "catalogue"-list before illustrations pp. Sealings: p. 341-75 and in the catalogue pp. 376-85.	n=6 stamp seals (ALL stone) n=131 sealings (stamped sealings & unstamped sealings/"jar stoppers")	Stamp seals: fig. 5.1.1-6, p. 341. Sealings: figs: 5.7-5.22.	Both Main Tell. Stamp seals: Level 4 (late 6th millennium cal. BC.) Sealings: Level 6 and Level 3.
Duistermaat K. & Akkermans P.M.M.G. 1996, "Of storage and nomads. The sealings from Late Neolithic, Sabi Abyad, Syria", Paleorient, vol. 22, no. 2, pp. 17-44.	n/a	300	See article in general.	n=14 stamped sealings	Fig. 4, p. 23; fig. 5.1-6, p. 25.	Main Tell, operation I. Level 6 "Burnt Village" c. 6,000 cal. BC.
Akkermans, P.M.M.G. & Duistermaat, K. 2004, "More Seals and Sealings from Neolithic Tell Sabi Abyad, Syria", Levant, vol. 36, pp. 1-11.	n/a	316	See article in general.	n=10 stamped sealings	Stamp seals: fig. 2.1-9, p. 4. Sealings: fig. 3.10-14, p. 6; fig. 4.14-19, p. 7 and fig. 5.20-23, p. 10.	Main Tell, operation I. Level 6 "Burnt Village" c. 6,000 cal. BC.
Verhoeven, M. 1999, An Archaeological Ethnography of a Neolithic Community: Space, Place and Social Relationships in the Burnt Village at Tell Sabi Abyad, Syria, Nederlands Historisch-Archaeologisch Instituut te Istanbul: Istanbul.	Section 7 "Sealings and Tokens" pp. 40-41 *in* Chapter 3: *"The Burnt Village"* pp. 25-44.	300	Chapter 3 pp. 24-44.	None	n/a	Main Tell, operation I. Level 6 "Burnt Village" c. 6,000 cal. BC.
Akkermans, P.M.M.G. *et al.* 2012, "Burning Down the House: the burnt building V6 at Late Neolithic Tell Sabi Abyad, Syria", Analecta Praehistorica Leidensia, vol. 43, no. 44, pp. 307-24.	n/a	66	Table 2 p. 315, p 318 & 320. Fig 10 p. 319.	n=2 stamped sealings	Fig. 8.c p. 315.	Main Tell, operation II, building in square V6 (various levels) c. 7,000-5,800 cal. BC.

Table 8.2: Detail of the sealings (plain "jar stoppers" and objects bearing stamp seal impressions) from Tell Sabi Abyad. These have been published extensively; total numbers of sealings illustrated, and referred to are listed according to publication, for the main Tell Sabi Abyad site publications to date.

TIER 3 SOURCES	NUMBER OF "TOKENS" REFERRED TO:
Akkermans, P. M. M. G. (Ed.) 1996b, Tell Sabi Abyad the Late Neolithic Settlement: Report on the Excavations of the University of Amsterdam (1988) and the National Museum of Antiquities Leiden (1991-1993) in Syria) Volume II, Nederlands Historisch-Archaeologisch Instituut te Istanbul: Istanbul.	**197**
Verhoeven, M. 1999, An Archaeological Ethnography of a Neolithic Community: Space, Place and Social Relationships in the Burnt Village at Tell Sabi Abyad, Syria, Nederlands Historisch-Archaeologisch Instituut te Istanbul: Istanbul.	**182**
Verhoeven, M & Akkermans, P. M. M. G. (Eds.) 2000, Tell Sabi Abyad II: The Pre-Pottery Neolithic B Settlement, Nederlands Historisch-Archaeologisch Instituut te Istanbul: Istanbul.	**19**
Akkermans, P.M.M.G. *et al.* 2012, "Burning Down the House: the burnt building V6 at Late Neolithic Tell Sabi Abyad, Syria", Analecta Praehistorica Leidensia, vol. 43, no. 44, pp. 307-24.	**57**
Tell Sabi Abyad electronic database (unpublished. TSAEP 1988-2010)	**1,177** "tokens" **1,537** All *probable* small geometric clay objects

Table 8.3: Detail of the tier 3 Tell Sabi Abyad sources (those which refer to "token" totals only, with no individual object description or illustration). A number of "tokens" from the publications have been recorded in full on the Clay Object Database at tier 2 level, though due to the nature of the tier 3 data, it cannot be assured how many and which. For more detailed information on the tier 3 published objects see Appendix E).

THREE-DIMENSIONAL SHAPE	NUMBER OF TIER 2CLAY OBJECTS	PERCENTAGE OF TIER 2CLAY OBJECTS
Sphere	27	27.00
F. /S. Sphere	11	11.00
Ovoid	1	1.00
F./S. Ovoid	2	2.00
Disc 1	6	6.00
Disc 2	3	3.00
Disc 3	2	2.00
Cube	1	1.00
Cuboid/f. Cube	1	1.00
Cone 1	8	8.00
Cone 2	1	1.00
Cone 3	2	2.00
Cone 4	**3**	3.00
Cone 5	4	4.00
Cylinder	6	6.00
Other	22	22.00
TOTAL	**100**	**100**

Table 8.4 Tier 2 Tell Sabi Abyad objects by three-dimensional shape.

CO#	THREE-DIMENSIONAL SHAPE	L (CM)	W (CM)	H/T (CM)	BASIC FORM	MARKINGS DESCRIPTION
2828	Flattened/ semi-sphere	4.10	4.10	1.45	Type-7: Round Depression(s)	Five small impressed "dots" on the upper surface of the object. Placed in a rough ring around the protruding part of the object.
2851	Sphere	1.80	1.80	1.80	Type-1: Straight, Independent Line(s)	Publication states: "band of nail impressions". The illustration shows vertical nail impressions in the form of "C" shapes arranged in a ring around the sides of the object. All are aligned in the same direction and are clearly deliberately placed.
2852	Flattened/ semi-ovoid	2.20	2.20	2.20	Type-1: Straight, Independent Line(s)	Publication states: "nail impressions". The illustration shows three clear fingernail impressions; two attached to clear, deep fingertip (and probable fingerprint) impressions.
2861	Flattened/ semi-sphere	1.30	1.30	0.50	Type-1: Straight, Independent Line(s)	Publication states: "curved incision". The illustration shows one clear "u" shaped impression on the side of the top surface of the object. Appears to be a nail impression though this is not mentioned in the object description (as is the case for other tier 2 objects).
2862	Flattened/ semi-sphere	1.10	1.10	0.80	Type-1: Straight, Independent Line(s)	Publication states: "nail impression". The illustration shows one clear "u" shaped impression on the side of the top surface of the object. This has evidently been made with a single nail (also seen on CO#s 2851, 2852 & 2862, published alongside this object)
2865	Flattened/ semi-sphere	4.00	4.00	1.30	Type-1: Straight, Independent Line(s)	Publication states: "with incisions". The illustration shows a flat base with two clear, straight lines which appear to have been incised with a reed. The top surface also has what appear to be many small dots incised onto the surface, those these are not mentioned in the object description.
2911	Cylinder	8.70		1.80	Type-1: Straight, Independent Line(s), Type-2: Straight Parallel Lines	Two sets of 4 parallel, diagonal notches along the length of two sides of the object. A total of 8 notches. A further linear line runs the length of the object.
2912	Cuboid	2.90	2.30	1.50	Type-7: Round Depression(s)	The main face of the object has 2 rows of 4 circular depressions. A further 2 can be seen in the edge of the fragmented face making a total of 10.
2916	Sphere (fragments)	5.40	4.80		Type-1: Straight, Independent Line(s)	Two of the three fragments are described as having a "seal impression" on their outer surface. The pictures do not suggest this is a stamp seal impression as found on hundreds of other scaly fragments at the site. These two impressions are clearly deliberate, yet are merely straight, incised/impressed lines: fragment "a" has 4 lines forming a rectangle, with a fifth, much shorted line incised at an angle inside the rectangle at the bottom. Fragment "b" is fragmented at the site of the "impression" visible is again one straight, incised or impressed line.

Table 8.5: Detail of the objects recorded from Tell Sabi Abyad, Tier 2 with decorative markings.

CO#	NUMBER OF FRAGMENTS	DIMENSIONS: L, W, T (CM)	DECORATIVE MARKINGS PRESENT?	BURNT?	"APPLIED TO" COMMENTS	ADDITIONAL COMMENTS:
2915	5	4.90 x 4.50 x 1.60	No	No	Objects have been applied to it: 8x spherical impressions can be seen in the interior surface. Described as "token impressions".	This object consists of 3 clay fragments which fit together and the object is described as "clay" (unclear is sun dried, fired or untreated). The original shape appears to have been spherical as all three fragments are curved with convex exteriors and concave interior surfaces. Two of the three fragments ("a" and "b") are described as having a "seal impression" on their outer surface (see "markings"). The largest fragment (a) also has a rounded, deep clear impression of a "token" in its interior surface, nearly identical to that found in the other "Bullae". The walls of the object are thick in relation to its size, suggesting it was deliberately broken. Size: (fragment "a"-see "dimensions" above. "b"- L 3.10cm x W 1.7cm "c"- L 3.9cm x W 2.50cm. The thickness of none of the fragments is recorded; the sketches suggest 1.50 to 2.00cm. The three fragments together constitute approximately 2/3 of the original object.
2916	3	5.40 x 4.80 x -	Straight, incised/impressed lines: fragment "a" has 4 lines forming a rectangle, with a 5th, much shorter line incised at an angle inside the rectangle at the bottom. Fragment "b" is fragmented at the site of the "impression" visible is again one straight, incised or impressed line. *See "Applied to" and "Additional Comments" for details of the impressions on the interior, concave surface of the "bullae".	2 of the 5 fragments are heavily burnt-red.	Objects have been applied to it: **one, dee**p and clear oval shaped impressions can be seen in the interior surface of the largest fragment (A). Described as "token impressions".	This object consists of 5 clay fragments, two which are smaller and redder than the other three, and perhaps come from a different item. The three main fragments appear to be part of a hollow, sphere or ball and fir together. The exterior surface of each is rounded (convex) and smooth. The largest fragment appears to consist of at least one third of the original sphere, and the interior, concave surface is covered in very clear, well defined rounded impressions. Approximately 60-70% of the original spherical object is represented by the three illustrated and photographed fragments. These three fragments show the object had thick walls relative to its size (thickness range: 1.1-1.6cm). This suggests it was deliberately broken. Only the dimensions of the largest fragments are provided. Notes read "looks like a bulla for small tokens" as these impressions x8 are all closely spaced and "token" sized. It is described as "unbaked" clay.

2917	2	6.10 x 5.10 x 3.20	No	No	Objects have been applied to it: 4 complete and 1 partial deep and clear oval shaped impressions can be seen in the interior surface. Described as "token impressions".	2 “unbaked clay” fragments. Probably the most complete of the four "bullae" type objects. Very similar to the two objects (CO#s 2915 & 2916) above. The largest fragment has four complete impressions on the interior, concave surface: oval shaped and described as "token" impressions. A fifth is partially visible. These are all closely spaced and in addition, a marking described as a "plant/rope impression" is detailed on the interior surface. The object has thick walls and the second fragment has an impression on the exterior-convex surface which may be a finger impression. Scratches or reed impressions are detailed as being on the exterior surface. The dimensions of the second fragment are not provided.
2918	1	9.00 x 6.80 x 3.10	No	No	Objects have been applied to it: 3 complete and clearly oval shaped impressions can be seen in the interior surface. Described as "token impressions".	This object consists of a single piece, a large fragment yet constitutes just less than half of the original object. It is described as “clay" (unclear is sun dried, fired or untreated). The fragment again is part of a hollow, spherical shaped object. The interior, concave surface has thee clear, deep rounded hollows, described as "token impressions". The exterior surface has what is described as a "depression on the front", a possible "seal impression". However the sketch and photographs suggesting this is merely a small area of flattening where the object has stood on a flat surface, rather than a deliberate "impression". The flat area is small and only round due to the curved surface of the object overall.

Table 8.6: Detail of the four “bullae” type objects recorded from Tell Sabi Abyad field notes.

THREE-DIMENSIONAL SHAPE	NUMBER OF TIER 1CLAY OBJECTS	% OF TIER 1CLAY OBJECTS
Sphere	70	23.89
F. /S. Sphere	42	14.33
Ovoid	24	8.19
F./S. Ovoid	11	3.75
Disc 1	27	9.22
Disc 2	40	13.65
Disc 3	3	1.02
Cube	1	0.34
Cuboid/f. Cube	0	0.00
Cone 1	21	7.17
Cone 2	6	2.05
Cone 3	0	0.00
Cone 4	15	5.12
Cone 5	1	0.34
Cylinder	6	2.05
Other/misc./Unknown	26	8.87
TOTAL	293	100.00

Table 8.7: Number and proportion of clay objects by detailed three-dimensional shape at Tell Sabi Abyad (tier 1-viewed clay objects).

FEATURE	DISC TYPE 1 (N=27)		DISC TYPE 2 (N=40)	
	YES/ PRESENT	NO/ ABSENT	YES/ PRESENT	NO/ ABSENT
Round in plan (type-A)	14	13	23	17
Oval in plan (type-B)	9	18	10	30
Egg-shaped (type-G)	1	26	1	39
Square (type-B)	1	26	0	40
Depressions?	5	22	8	32
Pinched?	2	25	2	38
Burnt?	3	22	3	32
Fired/Baked?	27	0	3	37
Fingerprints?	4	23	5	35
Heavy Wear?	12	15	12	28
Markings?	17	10	24	16
Markings: with fingernail decoration	1	26	3	37
Markings: 1 surface only?	8	9	15	9
Markings: both base and top surfaces?	9	8	9	15
Markings: 1 or both surfaces (top and base) covered in plant impressions/markings?	11	16	13	27
Impressions?	10	17	17	23
Sealing? (Maybe/Probably)	2	25	2	38
Organic inclusions (only)	8	19	11	29
Mineral Inclusions	5	22	8	32
Both (only)	4	23	6	34
No Inclusions	10	17	15	25
Fine Clay?	26	1	39	1
Coarse Clay?	1	26	1	39
Smooth or Very Smooth Finish?	22	5	37	3
“Smooth”	19	8	31	9
“Very Smooth”	3	24	6	34
Rough Finish?	5	22	3	37
"Coated?"	1	26	40	0
"Adhering Material?"	1	26	2	38

Table 8.8: Comparison of craft and other characteristics of type 1 (n-27) and type 2 (n-40) discs within the tier 1 Tell Sabi Abyad assemblage.

TYPE OF MINERAL INCLUSION	NUMBER OF CLAY OBJECTS	% OF MINERAL INCLUSION CONTAINING OBJECTS (N=88)	% OF ALL TIER 1 CLAY OBJECTS
Limestone/calcite	58	65.91	19.80
Mica	2	2.27	0.68
Chert-radiolarite /brownstone	5	5.68	1.71
Unidentified	112	127.27	38.23
Total	**177**	**201.14**	**60.41**

TYPE OF ORGANIC INCLUSION	NUMBER OF CLAY OBJECTS	% OF ORGANIC INCLUSION CONTAINING OBJECTS (N=114)	% OF ALL TIER 1 CLAY OBJECTS
Bone	1	0.88	0.34
Shell	2	1.75	0.68
Plant	98	85.96	33.45
Charcoal/carbonised plant	3	2.63	1.02
Phytolith	0	0.00	0.00
Misc. Organic	10	8.77	3.41
Total	**114**	**100.00**	**38.91**

Table 8.9: Inclusions: the type of **(top)** mineral and **(bottom)** organic inclusions visible (with hand lens) within the tier 1 Tell Sabi Abyad assemblage.

BASE COLOUR	ALL	% ALL	# FIRED SAB CLAY OBJECTS	% OF FIRED/ BAKED CLAY OBJECTS	# "UNBAKED"	% OF UNFIRED
Black	**82**	27.99	**81**	30.34	**2**	11.76
Dark Grey	**126**	43.00	**121**	45.32	**6**	35.29
Dark Brown	**18**	6.14	**17**	6.37	**1**	5.88
Mid-Grey	**66**	22.53	**61**	22.85	**4**	23.53
Mid-Brown	**62**	21.16	**54**	20.22	**4**	23.53
V. Light Grey OR Light Grey	**16**	5.46	**11**	4.12	**1**	5.88
Light Brown OR V. Light Brown	**29**	9.90	**24**	8.99	**3**	17.65
Orange-Brown OR Orange/Cream	**48**	16.38	**41**	15.36	**3**	17.65
Beige OR Cream	**26**	8.87	**22**	8.24	**2**	11.76
White	**5**	1.71	**3**	1.12	**1**	5.88

Table 8.10: The main or base colour of all tier 1 Tell Sabi Abyad clay objects compared to the prevalence of colours found within the compared to the 57 burnt and *possibly* burnt clay objects, and the 262 fired or baked clay objects.

MARKING DESIGN	TOTAL NUMBER OF CLAY OBJECTS WITH AT LEAST THIS DESIGN	% OF ALL SAB CLAY OBJECTS	% OF ALL MARKED CLAY OBJECTS (N=111)
TYPE-1: Straight, Independent Line(s)	44	15.02	39.64
TYPE-2: Straight Parallel Lines	7	2.39	6.31
TYPE-3: Straight Crossing Lines (squares)	4	1.37	3.60
TYPE-4: Straight Crossing Lines (diamonds)	4	1.37	3.60
TYPE-5: Zigzag(s)	0	0.00	0.00
TYPE-6: Wavy Line(s)	0	0.00	0.00
TYPE-7: Round Depression(s) Inc. stamp seal	8	2.73	7.21
TYPE-8: Incised Circular (complete or not) marking(s)	0	2.73	0.00
TYPE-9: Curved Line(s)	5	1.71	4.50
TYPE 10: Complete Hole(s)	3	1.02	2.70
TYPE-11: Matting Impression(s)	3	1.02	2.70
TYPE-12: Plant Impression(s)	34	11.60	30.63
TYPE-13: Detailed and intricate design OR Irregular	30	10.24	27.03

Table 8.11: The range and number of different designs of markings present on tier 1 Tell Sabi Abyad clay objects (present alone or in combination with other forms).

MARKINGS: THREE MOST COMMON FORMS	NUMBER OF CLAY OBJECTS	% OF ALL SAB CLAY OBJECTS	% OF ALL MARKED CLAY OBJECTS (N=111)
Type 1: alone	**28**	**63.64**	**25**
TYPE 1: With at least one other marking form	16	36.36	14
Type 12: alone	**25**	**73.53**	**23**
TYPE 12: With at least one other marking form	9	26.47	8
Type 13: alone	**19**	**63.33**	**17**
TYPE 13: With at least one other marking form	11	36.67	10

Table 8.12: Tier 1 Tell Sabi Abyad markings: the three most common forms.

3D SHAPE	TOTAL NUMBER OF CLAY OBJECTS	% OF ALL SAB CLAY OBJECTS (N=293)	NO. OF MARKED OBJECTS WITHIN SHAPE	% OF ALL MARKED OBJECTS (N=111)	% OF SHAPES' ASSEMBLAGE MARKED	NO. OF OBJECTS UNMARKED WITHIN SHAPE
Sphere	70	23.89	16	14.41	22.86	54
F. /s. Sphere	42	14.33	17	15.32	40.48	25
Ovoid	24	8.19	6	5.41	25.00	18
F./s. Ovoid	11	3.75	5	4.50	45.45	6
Disc 1	27	9.22	17	15.32	62.96	10
Disc 2	40	13.65	23	20.72	57.50	17
Disc 3	3	1.02	1	0.90	33.33	2
All discs combined	70	23.89	41	36.94	58.57	29
Cube	1	0.34	0	0.00	0.00	1
Cone 1	21	7.17	6	5.41	28.57	15
Cone 2	6	2.05	1	0.90	16.67	5
Cone 4	15	5.12	9	8.11	60.00	6
Cone 5	1	0.34	0	0.00	0.00	1
All cones combined	43	14.68	16	14.41	37.21	27
Cylinder	6	2.05	0	0.00	0.00	6
Other/misc./unknown	26	8.87	10	9.01	38.46	16

Table 8.13: Markings and three-dimensional shape: tier 1 Tell Sabi Abyad clay objects.

LEVEL OF OBJECT RECORDING	NUMBER OF CLAY OBJECTS	TIER DETAIL	OBJECT MORPHOLOGY RECORDING	CONTEXT OF CLAY OBJECTS: LEVEL OF DETAIL AVAILABLE:
Tier 1	**293**	Viewed in person	Full	Extensive to partial.
Tier 2	**100**	Object morphology recorded from publications (or from unpublished site notes: 4 objects).	Limited	Varies from extensive to moderate. (Dependent on publication).
Tier 3	**273** **1535**	General published literature Electronic object list ("box file")	None (individual objects not studied or recorded).	Published sources (n=273 objects) no information for specific, individual objects. Limited information (tell, level and/or cultural) for some groups of published objects.

Table 8.14: Table showing the number of Tell Sabi Abyad clay objects studied according to their tier of recording, along with the level of detail available with regards to the context of these objects.

BROAD CULTURAL PHASE *(youngest to oldest)*	**NUMBER OF RECORDED CLAY OBJECTS**	**AS A % OF ALL RECORDED CLAY OBJECTS (N=393)**	**AS A % OF BROADLY PHASED CLAY OBJECTS (N=377)**	**AS A % OF FULLY PHASED CLAY OBJECTS (N=102)**
Late Neolithic (ceramic: 6,900-5,700)	*367*	*93.38*	*97.35*	*n/a*
Early Neolithic (pre-ceramic: pre 6,900)	*10*	*2.54*	*2.65*	*n/a*
BROAD PHASE TOTAL:	***377***	***95.93***	***100.00***	***n/a***
SPECIFIC CULTURAL PHASE (youngest to oldest)				
Early Halaf-(5,900-5,800)	12	3.05	3.18	11.76
Transitional/Early Halaf-(6,000/5,900)	3	0.76	0.80	2.94
Transitional (into Halaf)-(6,000)	69	17.56	18.30	67.65
Pre-Halaf-(6,200-6,100)	20	5.09	5.31	13.33
Early PN-(6,700-6,300) / Pre-Halaf-(6,200-6,100)	3	0.76	0.80	2.00
Early PN-(6,700-6,300)	32	8.14	8.49	21.33
Initial PN-(6,900-6,800)	1	0.25	0.27	0.98
PPNB (ca. 7,550 - 7,000) (ca. 7,550 - 7,000) OR Early PN-(6,700-6,300)	1	0.25	0.27	0.98
PPNB (ca. 7,550 - 7,000)	9	2.29	2.39	8.82
SPECIFIC PHASE TOTAL:	**102**	**38.17**	**n/a**	**100.00**

Table 8.15: Distribution of the (tier 1 and 2) studied clay objects from Tell Sabi Abyad by broad (ceramic vs. pre-ceramic Neolithic) and specific cultural phase (as published by Nieuwenhuyse *et al.* 2010: fig. 3 p. 76). All dates are approximate, and in years cal. BC.

AREA	CULTURAL PHASE	NUMBER OF RECORDED CLAY OBJECTS	AS A % OF ALL RECORDED CLAY OBJECTS WITHIN AREA
Op. I, main tell (n=86)	Early Halaf-(5,900-5,800)	12	13.95
	Transitional/Early Halaf-(6,000/5,900)	3	3.49
	Transitional (into Halaf)-(6,000)	69	80.23
	Pre-Halaf-(6,200-6,100)	1	1.16
	Early PN-(6,700-6,300)	1	1.16
	Initial PN-(6,900-6,800)	0	0.00
	AREA TOTAL:	**86**	**100.00**
Op. II, main tell (n=4)	Pre-Halaf-(6,200-6,100)	4	100.00
	AREA TOTAL:	**4**	**100.00**
Op. III, main tell (n=275)	Broad Late Neolithic (ceramic: 6,900-5,700) Exact period not published	227	82.55
	Pre-Halaf-(6,200-6,100)	15	5.45
	Early PN-(6,700-6,300) / Pre-Halaf-(6,200-6,100)	3	1.09
	Early PN-(6,700-6,300)	30	10.91
	AREA TOTAL:	**275**	**100.00**
Sabi Abyad II (n=10)	PPNB (ca. 7,550 - 7,000) (ca. 7,550 - 7,000) OR Early PN-(6,700-6,300)	1	10.00
	PPNB (ca. 7,550 - 7,000)	9	90.00
	AREA TOTAL:	**10**	**100.00**
Sabi Abyad III (n=18)	Early PN-(6,700-6,300)	1	5.56
	Initial PN-(6,900-6,800)	1	5.56
	AREA TOTAL:	**2**	**11.11**
	TOTAL:	**377**	**-**

Table 8.16: Distribution of the (tier 1 and 2) studied clay objects from Tell Sabi Abyad by specific cultural phase (as published by Nieuwenhuyse *et al.* 2010: fig. 3 p. 76) within each excavation area. All dates are approximate, and in years cal. BC.

TIER 3 SOURCE	TELL	OPERATION (main tell only)	STRATIGRAPHIC *LEVEL*	TOKENS PER LEVEL	CULTURAL *PHASE* (Approximate dates in years cal. BC).	TOTAL NUMBER OF "TOKENS"	NUMBER OF "TOKENS" INDIVIDUALLY ILLUSTRATED (RECORDED AT TIER 2 LEVEL)
Akkermans 1996b	Main	Operation I	8	1	Pre-Halaf, c. 6,200-6,100	**197**	**55**
			7	0	Pre-Halaf/Transitional Halaf, c. 6,100/6,000		
			6	167	Transitional Halaf, c. 6,000		
			5	4	Transitional Halaf, c. 6,000		
			4	8	Transitional Halaf/Early Halaf, c. 6,000/5,900		
			3B	17	Early Halaf, c. 5,900-5,800		
			ALL LEVELS TOTAL:	**197**	**Pre-Halaf to Early Halaf**		
Verhoeven 1999	Main	Operation I	**6**	**182**	**Transitional Halaf , c. 6,000**	**182**	**0**
Akkermans and Verhoeven 2000	Tell Sabi Abyad II	n/a	7	4	PPNB	**19**	**5** (plus 5 objects of other designations)
			5	3	PPNB		
			3	9	PPNB		
			2	1	PPNB		

			1	2	Ceramic Neolithic		
			ALL LEVELS TOTAL:	**19**	**c. 7,550-6,850 cal. BC**		
Akkermans *et al.* 2012	Main	Operation II, Sq. V6	n/a	NOT PUBLISHED	From: Initial PN post 7,000 cal. BC To: end of Early Halaf c. 5,800 cal. BC.		
			ALL LEVELS TOTAL:	**57**	**"Late Neolithic" c. 7,000-5,800 cal. BC.**	**57**	**0**

Table 8.17: Detail of the clay objects studied at tier 3 level (total number of "tokens" referred to in passing, and with general references only) -those from publications only. Tier 3 clay objects come from three publications, and can be organised according to occupation level within operation I of the main tell, and Tell Sabi Abyad II. (Note: "Cultural Phase" terminology and dates represent approximate years cal. BC according to level as published by Nieuwenhuyse *et al.* 2010: fig. 5 p. 78, apart from Akkermans & Verhoeven 2000: p. 1, fig. 4.3 p. 93).

SITE AREA	EXCAVATION SQUARE	NUMBER OF CLAY OBJECTS RECORDED	AS A % OF ALL RECORDED (N=393)	AS A % OF AREAS TOTAL
Op. I (main tell)	**P13**	3	0.76	3.49
	P15	3	0.76	3.49
	Q12	4	1.02	4.65
	Q13	26	6.62	30.23
	Q14	3	0.76	3.49
	Q15	10	2.54	11.63
	R13	3	0.76	3.49
	R14	2	0.51	2.33
	Not published/not detailed	32	8.14	37.21
	OP. I - TOTAL (86):	**86**	**21.88**	**N/A**
Op. II (main tell)	**V6**	4	1.02	100.00
	OP. II - TOTAL:	**4**	**1.02**	**N/A**
Op. III (main tell)	**D4**	**2**	0.51	0.73
	F4	**25**	6.36	9.09
	G4N	**7**	1.78	2.55
	G5	**7**	1.78	2.55
	G6	**2**	0.51	0.73
	H3	**9**	2.29	3.27
	H4	**3**	0.76	1.09
	H4 I4	**29**	7.38	10.55
	H5	**2**	0.51	0.73
	H5 I5	**8**	2.04	2.91
	H5E	**17**	4.33	6.18
	H5S	**2**	0.51	0.73
	H5W	**12**	3.05	4.36
	I3	8	2.04	2.91
	I3N	**3**	0.76	1.09
	I4	1	0.25	0.36
	I5	5	1.27	1.82
	I6	4	1.02	1.45
	J3	**3**	0.76	1.09
	J3N	**9**	2.29	3.27
	J3S	**5**	1.27	1.82
	J4	**1**	0.25	0.36
	J4N	**38**	9.67	13.82
	J4S	**11**	2.80	4.00
	J5N	**15**	3.82	5.45
	J5S	**1**	0.25	0.36
	K3S	**32**	8.14	11.64
	K4N	**13**	3.31	4.73
	Not published/not detailed	**1**	0.25	0.36
	OP. III - TOTAL:	275	69.97	**N/A**
Tell Sabi Abyad II	**G5**	2	0.51	20.00

	H6	3	0.76	30.00
	H7	4	1.02	40.00
	???	1	0.25	10.00
	TELL II - TOTAL:	275	69.97	**N/A**
Tell Sabi Abyad III	**H7**	1	0.25	5.56
	H8	1	0.25	5.56
	I6	1	0.25	5.56
	I7	1	0.25	5.56
	I7E	2	0.51	11.11
	I18E	1	0.25	5.56
	J7	5	1.27	27.78
	J7W	1	0.25	5.56
	J8	1	0.25	5.56
	J9	4	1.02	22.22
	TELL III - TOTAL:	18	4.58	**N/A**

Table 8.18: Horizontal distribution of studied small geometric clay objects from Tell Sabi Abyad according to area of site, and 10 m^2 excavation squares within each.

FILL TYPE	SITE AREA				# ALL AREAS	% OF OBJECTS
	OP. I	OP. II	OP. III	TELL III		
Ashy fill layer/horizon/accumulation	0	0	58	3	**61**	**15.52**
Burial/Grave fill	0	0	1	1	**2**	**0.51**
Courtyard fill	0	0	5	1	**6**	**1.53**
Debris layer FILL	0	0	1	0	**1**	**0.25**
Doorway fill	0	0	1	0	**1**	**0.00**
Hearth fill	0	0	27	0	**27**	**0.25**
Jar/vessel fill	0	0	1	0	**1**	**6.87**
Kiln fill	2	0	0	0	**2**	**0.25**
Oven fill	0	0	12	1	**13**	**0.51**
Pit fill	1	0	27	2	**30**	**3.31**
Room fill	2	4	25	2	**33**	**7.63**
Storage Bin fill	0	0	0	0	**0**	**8.40**
Other/general fill material (detail in notes)	0	0	74	1	**75**	**19.08**
MIXED/UNCERTAIN FILL						
Ashy fill layer… AND Courtyard fill	0	0	1	0	**1**	**0.25**
Ashy fill layer… AND Courtyard fill AND Other fill	0	0	2	0	**2**	**0.51**
Ashy fill layer… AND Debris layer fill	0	0	4	1	**5**	**1.27**
Ashy fill layer… AND Debris layer fill AND Other fill…	0	0	4	0	**4**	**1.02**
Ashy fill layer… AND Debris layer fill AND Pill fill	0	0	1	0	**1**	**0.25**
Ashy fill layer… AND Ditch fill	0	0	0	2	**2**	**0.51**
Ashy fill layer… AND Other…	0	0	4	0	**4**	**1.02**
Ashy fill layer… AND Pit fill	0	0	4	0	**4**	**1.02**
Burial/Grave fill AND Debris layer fill AND Ashy fill layer…	0	0	1	0	**1**	**0.25**
Burial/Grave fill AND Other…	0	0	3	0	**3**	**0.76**
Courtyard fill AND Other…	0	0	9	0	**9**	**2.29**
Debris layer fill AND Other…	0	0	0	1	**1**	**0.25**
Oven fill, Room fill	0	0	1	0	**1**	**0.25**
Room fill AND Other…	0	0	1	0	**1**	**0.25**
TOTAL	**5**	**4**	**267**	**15**	**291**	**74.05**

Table 8.19: Distribution of studied Tell Sabi Abyad clay objects by fill type and site area (Operations I to III are all located on the main tell). (n=291, 74.05% come from fill contexts).

LOCATION OF CONTEXT	NATURE OF CONTEXT	NO. OF OBJECTS	% OF CLAY OBJECTS
Building (unspecified)	Doorway	1	**0.25**
Building (unspecified)	Floor, Room	1	**0.25**
Building (unspecified)	Floor, Unclear/not detailed, Under Room Floor	1	**0.25**
Building (unspecified)	Oven	1	**0.25**
Building (unspecified)	Room	15	**3.82**
Building (unspecified)	Room	1	**0.25**
Building (unspecified)	Room	1	**0.25**
Building (unspecified)	Room, Wall	1	**0.25**
Building (unspecified)	Wall	3	**0.76**
Building complex	Courtyard	1	**0.25**
Building complex	Oven , Room	1	**0.25**
Building complex	Room	8	**2.04**
Building complex	Room, wall	1	**0.25**
Building-"tholos"	Room	6	**1.53**
Building-rectilinear	Room	69	**17.56**
Building-tripartite	Room	2	**0.51**
Building-T-shaped	Room	4	**1.02**
Possible building (any type)	Room	6	**1.53**
TOTAL NUMBER OF CLAY OBJECTS FROM INTERNAL SPACES		**121**	**30.79**
Courtyard	n/a	8	**2.04**
Courtyard	Platform	2	**0.51**
Courtyard/Open area (unclear which)	Courtyard	1	**0.25**
Courtyard/Open area (unclear which)	Underneath platform/platform foundation	2	**0.51**
Midden/refuse area	n/a	1	**0.25**
Open area	n/a	175	**44.53**
Open area	Courtyard	28	**7.12**
Open area	Other (detail in notes)	1	**0.25**
Open area	Between Buildings	1	**0.25**
Open area	Between Buildings	1	**0.25**
Open area	Ditch	2	**0.51**
Open area	Other	1	**0.25**
Open area	Oven	11	**2.80**
Open area	Unclear/not detailed	3	**0.76**
Open burial area (entire square)	n/a	6	**1.53**
Open burial area (entire square)	n/a	1	**0.25**
Passage	Between Buildings	3	**0.76**
Pit	Other (detail in notes)	1	**0.25**
Possible/probable Open area	Courtyard	1	**0.25**
Possible/probable Open area	n/a	2	**0.51**
Possible/probable Open area	Unclear/not detailed	1	**0.25**
Top soil/surface find (unstratified)	n/a	1	**0.25**
TOTAL NUMBER OF CLAY OBJECTS FROM EXTERNAL SPACES		**254**	**64.63**
Unclear/uncertain	n/a	14	**3.56**
Not published (tier 2)	n/a	1	**0.25**
Not published (tier 2)	n/a	3	**0.76**
TOTAL		393	100.00

Table 8.20: Detail of the context type of all studied Tell Sabi Abyad small geometric clay objects (n=393) separated by internal and external context types, summarising the 1) *Location a*nd 2) *Nature* of each context.

AREA	CONTEXT TYPE	LOCATION WITHIN CONTEXT	NUMBER OF CLAY OBJECTS	% OF ALL CLAY OBJECTS	% OF AREA'S TOTAL
Tell Sabi Abyad, op. I (n=86)	Building-"tholos"	Room	6	1.53	6.98
	Building-rectilinear	Room	69	17.56	80.23
	Open area	Between Buildings	1	0.25	1.16
	Open area	n/a	6	1.53	6.98
	Open area	Other	1	0.25	1.16
	Not published (tier 2)	n/a	3	0.76	3.49
	Op. I: TOTAL INTERNAL		**75**	**19.08**	**87.21**
	TOTAL EXTERNAL		**8**	**2.04**	**9.30**
Tell Sabi Abyad, op. III (n=275)	Building complex	Courtyard	1	0.25	0.36
	Building (unspecified)	Doorway	1	0.25	0.36
	Building (unspecified)	Floor, Room	1	0.25	0.36
	Building (unspecified)	Floor, Unclear/ Under Room Floor	1	0.25	0.36
	Building (unspecified)	Oven	1	0.25	0.36
	Building complex	Oven , Room	1	0.25	0.36
	Building (unspecified)	Room	15	3.82	5.45
	Building complex	Room	8	2.04	2.91
	Possible building (any type)	Room	6	1.53	2.18
	Building complex	Room, wall	1	0.25	0.36
	Building (unspecified)	Wall	3	0.76	1.09
	Courtyard	n/a	8	2.04	2.91
	Courtyard/Open area (unclear which)	Courtyard	1	0.25	0.36
	Open area	n/a	162	41.22	58.91
	Open area	Oven	11	2.80	4.00
	Open area	Other (detail in notes)	1	0.25	0.36
	Open area	Courtyard	28	7.12	10.18
	Possible/probable Open area	n/a	2	0.51	0.73

Possible/probable Open area	Unclear/not detailed	1	0.25	0.36
Possible/probable Open area	Courtyard	1	0.25	0.36
Open burial area (entire square)	n/a	6	1.53	2.18
Midden/refuse area	n/a	1	0.25	0.36
Top soil/surface find (unstratified)	n/a	1	0.25	0.36
Unclear/uncertain	n/a	14	3.56	5.09
Op. III:	**TOTAL INTERNAL**	**38**	**9.67**	**13.82**
	TOTAL EXTERNAL	**222**	**56.49**	**80.73**

Table 8.21: Location and nature of context type by site area: operation I and operation III (main tell).

AREA	NUMBER OF ADDITIONAL ARTEFACTS IN IMMEDIATE ASSOCIATION	NUMBER OF CLAY OBJECTS	% OF CLAY OBJECTS (WITH THIS INFORMATION AVAILABLE, N=345)	% OF GEOMETRICS WITH ADDITIONAL ARTEFACTS IN DIRECT ASSOCIATION (N=132)	AS A % OF CLUSTER CLAY OBJECTS (N=105)	AS A % OF (STUDIED) CLAY OBJECTS WITHIN EACH AREA
Operation I, main tell (n=86)	**None**	**1**	**0.29**	**n/a**	**n/a**	**1.16**
Operation I, main tell	Cluster (≥ 2 artefacts)	60	17.39	45.45	57.14	**69.77**
Operation II, main tell (n=4)	**None**	**0**	0.00	**n/a**	**n/a**	**0.00**
Operation II, main tell	Cluster (≥ 2 artefacts)	4	**1.16**	3.03	3.81	**100.00**
Operation III, main tell (n=275)	**None**	**200**	**57.97**	**n/a**	**n/a**	**72.73**
Operation III, main tell	Cluster (≥ 2 artefacts)	40	11.59	30.30	38.10	**14.55**
Sabi Abyad II (n=10)	**None**	**n/a**	**0.00**	**n/a**	**n/a**	**0.00**
Sabi Abyad II	Cluster (≥ 2 artefacts)	0	0.00	0.00	0.00	**0.00**
Sabi Abyad III (n=18)	**None**	**12**	**3.48**	**n/a**	**n/a**	**66.67**
Sabi Abyad III	Cluster (≥ 2 artefacts)	1	0.29	0.76	0.95	**5.56**

Table 8.22: Distribution of cluster clay objects compared to clay objects deposited alone, according to site area.

ALL OPERATION I (MAIN TELL) "TOKENS"	BUILDING I (REC.)	BUILDING II (REC.)	BUILDING IV (REC.)	BUILDING V (REC.)	BUILDING VI (THO.)	BUILDING IX (THO.)	BUILDING X (REC.)
ROOM 1			1				
ROOM 2			1		3		
ROOM 3	*1*			1	1		1
ROOM 6		40		1			
ROOM 7		4		7			
ROOM 11	*7*						
ROOM 13		1					
ROOM 14	*1*						
ROOM 17	*1*						
SINGLE CELL SPACE						*2*	
ROOM NOT PUBLISHED				*1*			
TOTAL PER BUILDING	**10**	**45**	**2**	**10**	**4**	**2**	**1**

Table 8.23: Detail of the location (by building number, building type-rectilinear or tholos and by room number) and number of the studied geometric clay objects or "tokens" from operation I (specific room within building is available for 74 of the area's 86 studied clay objects). Numbers underlined in lighter font are those where were not detailed as being recovered in a cluster.

COMBINATION OF ASSOCIATED ARTEFACTS FOUND IN HOW MANY EXAMPLES OF "CLUSTERS"	ARTEFACT TYPE	COUNT	ARTEFACT TYPE	COUNT	ARTEFACT TYPE	COUNT	ARTEFACT TYPE	COUNT	ARTEFACT TYPE	COUNT
3 examples	Token	2	Stone bead	3	Grinding slab/stone	1	"Lump of clay"	2	-	-
2 examples	Token	1	Stone bead	1	-	-	-	-	-	-
1 example	Token	1	Clay bead	1	Bone awl	1	-	-	-	-
1 example	Token	6	Bone awl	1	Stone mortar	1	Cone spatula	2	Grinding slab	2
5 examples	Token	2	-	-	-	-	-	-	-	-
6 examples	Token	5	-	-	-	-	-	-	-	-

Table 8.24: Object associations: examples of the nature, number and combination of artefacts found in direct and intentional association with studied (tier 1) small geometric clay objects form Tell Sabi Abyad. See the Sabi Abyad Context data base for many more examples and full records.

CLAY OBJECT NO.	AREA	3D SHAPE	BUILDING	ROOM	LOCATION OF CONTEXT	LOCATION WITHIN STRUCTURE/OPEN AREA
2889	Op. I	Other/miscellaneous	I	11	Building-"rectilinear"	Room
2883	Op. I	Other/miscellaneous	I	11	Building-"rectilinear"	Room
2884	Op. I	Other/miscellaneous	I	11	Building-"rectilinear"	Room
2885	Op. I	Other/miscellaneous	I	11	Building-"rectilinear"	Room
2886	Op. I	Other/miscellaneous	I	11	Building-"rectilinear"	Room
2887	Op. I	Other/miscellaneous	I	11	Building-"rectilinear"	Room
2888	Op. I	Other/miscellaneous	I	11	Building-"rectilinear"	Room
2893	Op. I	Other/miscellaneous	II	6	Building-"rectilinear"	Room
2845	Op. I	Other/miscellaneous	II	6	Building-"rectilinear"	Room
2894	Op. I	Other/miscellaneous	II	6	Building-"rectilinear"	Room
2895	Op. I	Other/miscellaneous	II	6	Building-"rectilinear"	Room
2897	Op. I	Other/miscellaneous	II	6	Building-"rectilinear"	Room
2881	Op. I	Other/miscellaneous	II	6	Building-"rectilinear"	Room
2847	Op. I	Other/miscellaneous	II	6	Building-"rectilinear"	Room
2902	Op. I	Other/miscellaneous	IV	2	Building-"rectilinear"	Room
2890	Op. I	Other/miscellaneous	IV	1	Building-"rectilinear"	Room
2891	Op. I	Other/miscellaneous	V	3	Building-"rectilinear"	Room
2901	Op. I	Other/miscellaneous	n/a	n/a	Open area	Other (detail in notes)
2880	Op. I	Other/miscellaneous	n/a	n/a	Open area	Not applicable
2892	Op. I	Other/miscellaneous	n/a	n/a	Open area	Not applicable
2896	Op. I	Other/miscellaneous	n/a	n/a	Not published	Unclear/not detailed

Table 8.25: Distribution and detail within operation I (main tell) of the area's n=21 "other" shaped clay objects.

CLAY OBJECT NO.	MASTER FILE NO.	MOUND	OPERATION	SQUARE	LOCUS-LOT	STRATA	LEVEL	PERIOD	LOCATION
105	O09-233	Main	III	K4N	21-188	Unavailable	Unavailable	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Open area
287	O09-322	Main	III	K3S	39-230	Unavailable	Unavailable	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Open area

FILL/DEPOSITION CHARACTER	LOCATION OF "TOKENS" WITHIN PRIMARY CONTEXT	LOCATION OF PRIMARY CONTEXT WITHIN TRENCH	OTHER FEATURES WITHIN SQUARE	NOTES (CONTEXT DESCRIPTION)
"Debris", ash, ash pockets, charcoal parts, clay, lime spots, loam, mud-brick fragments/debris, stones "pebbles" (<6 cm).	NE	NE	Burial (1), Fire pit (3+), Hearth (1), Tholoi (1)	Locus 21 – Multiple Soil Layers - Excavated on 16 May to 1 June -Characterised as distinct layers x4 separating "B" – Tell from the "C"-Tell. Each is 7-14cm wide on the surface, and visible as : 1-brown with lime spots Locus 21 – Multiple Soil Layers - E
None recorded on deposition form	No information /unclear	No information /unclear	None	Locus 39 - Excavated on 10 June -Locus for recording stray (unstratified) finds from this level and the few days around this. -The square is an open area with no features.

Table 8.26: Detail of the context of the two stamped geometrics CO#s 105 and 287.

CLAY OBJECT NO.	MASTER FILE NUMBER	SQ.	LOCUS	LOT	LEVEL	PERIOD	B.	R.	LOCATION OF CONTEXT/AREA TYPE
2889	SAB88 O86a	Q13	43	237	3A	Early Halaf-(5,900-5,800)	I	11	Building-rectilinear
2888	SAB88 O87-VI	Q13	43	237	3A	Early Halaf-(5,900-5,800)	I	11	Building-rectilinear
2887	SAB88 O87-V	Q13	43	237	3A	Early Halaf-(5,900-5,800)	I	11	Building-rectilinear
2886	SAB88 O87-IV	Q13	43	237	3A	Early Halaf-(5,900-5,800)	I	11	Building-rectilinear
2885	SAB88 O87-III	Q13	43	237	3A	Early Halaf-(5,900-5,800)	I	11	Building-rectilinear
2884	SAB88 O87-II	Q13	43	237	3A	Early Halaf-(5,900-5,800)	I	11	Building-rectilinear
2883	SAB88 O87-I	Q13	43	237	3A	Early Halaf-(5,900-5,800)	I	11	Building-rectilinear
2897	P91-73	Q13	112	334	6	Transitional-(6,000)	II	6	Building-rectilinear
2895	P91-118	Q13	112	341	6	Transitional-(6,000)	II	6	Building-rectilinear
2894	P91-27	Q13	103	274	6	Transitional-(6,000)	II	6	Building-rectilinear
2893	P91-93	Q13	112	336	6	Transitional-(6,000)	II	6	Building-rectilinear
2890	P92-47	Q14	100	240	6	Transitional-(6,000)	IV	1	Building-rectilinear
2891	P92-86	Q15	121	476	6	Transitional-(6,000)	V	3	Building-rectilinear
2896	SAB88 P-34	P15	012	20	3A	Early Halaf-(5,900-5,800)	n/a	n/a	Not published
2892	SAB88 O-29	R13	022	58	3A	Early Halaf-(5,900-5,800)	n/a	n/a	Open area

Table 8.27: Context of the n=15 "miniature vessel tokens". All were recovered from operation I at Tell Sabi Abyad and most (all but two) come from a room ("R") within a building ("B").

CO#	OBJECT NUMBER	3D SHAPE	PLAN VIEW SHAPE	AREA	SQUARE	LOCUS	LOT	PERIOD	WITHIN FILL MATERIAL?	WITHIN BUILDING MATERIAL?	LOCATION OF CONTEXT/AREA TYPE	LOCATION WITHIN STRUCTURE/FEATURE/OPEN AREA	FILL/DEPOSITION CHARACTER AND "INCLUSIONS"	LOCATION OF "TOKENS" WITHIN PRIMARY CONTEXT	LOCATION OF PRIMARY CONTEXT WITHIN TRENCH	OTHER FEATURES WITHIN THE SQUARE
109	O09-43	Cone 4 (pinched)	Type-g, regular	Op. III (main tell)	J4S	496	898	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Other/general fill material (detail in notes)	No	Open area	n/a	Clay, Loam, Mud-brick fragments/debris	No information/unclear	No information/unclear	Tholoi (1)
114	O09-38	Cone 4 (pinched)	Type-a regular	Op. III (main tell)	H4 I4	263	403	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Ashy fill layer/horizon/accumulation	No	Unclear/uncertain	n/a	Ash, Ash pockets, Burnt Earth, Charcoal parts, Clay, Lime spots, Loam, Mud-brick fragments/debris	Centre, S	NE	Fire pit (3+), Pits (2), Rectilinear Building (1)
129	O09-351	Cone 4 (pinched)	Type-c regular	Op. III (main tell)	H5	252	735	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	No information/unclear	Loam, Misc. Clay	Building (unspecified function/shape)	Floor, Room	Clay, Loam	S, SW	Centre	Rectilinear Buildings (2)
130	O09-44	Cone 2 (ova	Type-a regu	Op. III (ma	J4S	496	898	Late Neolithic (ceramic:	Other/general fill material	No	Open area	n/a	Clay, Loam, Mud-brick fragments/deb	No information/unclear	No information/unclear	Tholoi (1)

		l base)	lar	in tell)				6,900-5,700). Exact period uncertain.	(detail in notes)				ris			
137	O09-53	Cone 4 (pinched)	Type-a regular	Op. III (main tell)	I3	166	716	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Room fill	No	Building (unspecified function/shape)	Room	Animal bone, Charcoal parts, Clay, Grain, Lime spots, Loam, Mud-brick fragments/debris, Pottery sherds, Silica/Plant remains	SW	SE	Pits (2), Rectilinear Building (3+), Wall(s) (unclear what feature attached to)
150	O09-45	Cone 4 (pinched)	Type-a regular	Op. III (main tell)	H5 I5	566	666	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Other/general fill material (detail in notes)	No	Open area	n/a	Charcoal parts, Clay, Lime spots, Loam	SW	SW	Pits (3+), Rectilinear Building (3+)
158	O09-112	Cone 4 (pinched)	Type-g, regular	Op. III (main tell)	H4 I4	264	477	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Courtyard fill, Other/general fill material (detail in notes)	No	Open area	Courtyard	Ash, Ash pockets, Charcoal parts, Clay, Lime spots, Loam	No information/unclear	Centre, N	Hearths (3+), Pits (3+), Rectilinear Building (1), Wall(s) (unclear what feature attached to)

183	O09-89	Cone 4 (pinched)	Type-a regular	Op. III (main tell)	H4 I4	254	440	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Room fill	No	Building (unspecified function/shape)	Room	Clay, Loam, Mud-brick fragments/debris	No information/unclear	No information/unclear	
203	O09-229	Cone 4 (pinched)	Type-e, regular	Op. III (main tell)	J5N			Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	No information/unclear	No information/unclear	Unclear/uncertain	n/a		No information/unclear	No information/unclear	
208	O09-67	Flattened/semi-sphere	Type-e, regular	Op. III (main tell)	H4 I4	254	437	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Room fill	No	Building (unspecified function/shape)	Room	Clay, Loam, Mud-brick fragments/debris, Silica/Plant remains	SE	Centre, SE	Pits (3+), Rectilinear Buildings (2)
209	O09-337	Cone 4 (pinched)	Type-a regular	Op. III (main tell)	J5N	200	407	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Other/general fill material (detail in notes)	No	Open Area	n/a	None recorded on deposition form	Centre	Centre, W	Hearths (3+), Oven (3+), Wall(s) (unclear what feature attached to)
226	O10-82	Cone 4 (pinche	Type-d irregula	Sabi Abyad III	J9	13	18	n/a	Oven fill	No	Open Area	n/a	Ash pockets, Charcoal parts, Cobbles (6-25 cm), Stones	No information/unclear	Centre, E	Pits (2), Platform (1), Wall(s) (unclear

		d)	r										"Pebbles" (<6 cm)			what feature attached to)
272	O08-24	Cone 4 (pinched)	Type-c regular, type-g, regular	Op. III (main tell)	F4	178	425	Late Neolithic (ceramic: 6,900-5,700). Exact period uncertain.	Pit fill	No	Unclear/uncertain	n/a	Ash, Charcoal parts, Lime spots	No information/unclear	Centre, N	Oven (1)
273	O08-171	Cone 4 (pinched)	Type-a regular	Op. III (main tell)	H4	133	323	Early PN-(6,700-6,300)	Courtyard fill	No	Open area	Courtyard	Charcoal parts, Lime spots, Mud-brick fragments/debris, Seeds	NE	Centre, S	Oven (1), Rectilinear Building (3+), Wall(s) (unclear what feature attached to)
325	O10-221	Cone 4 (pinched)	Type-b irregular	Sabi Abyad III	J7	27	176	n/a	Burial/Grave fill	No	Open burial area (entire square)	n/a	Animal bone, Ash, Ash pockets, Mud-brick fragments/debris, Pottery sherds	NW	N	Burials (3+)

Table 8.28: Basic detail of the context of the n=15 “anthropomorphic cones”.

ROOM WITHIN BUILDING I, V6	NO. OF "TOKENS"	% OF ALL "TOKENS"
Room 1	15	26.32
Room2	0	0.00
Room3	34	59.65
Room4	3	5.26
Room5	5	8.77
Room6	0	0.00
Room7	0	0.00
Room8	0	0.00
Building total	**57**	**100.00**
Tokens as a % of all building I, V6 artefacts:		***15.36***

Table 8.29: Distribution of "tokens" by room within building I. Operation II, square V6, main tell.

ROOM WITHIN BUILDING I, V6	NO. OF "SEALINGS & JAR STOPPERS" (INC. "BULLAE")	% OF ALL "SEALINGS AND JAR STOPPERS "
1	14	21.21
2	0	0.00
3	22	33.33
4	0	0.00
5	30	45.45
6	0	0.00
7	0	0.00
8	0	0.00
ALL	**66**	**100.00**
Sealings a % of all building I artefacts:		***17.79***

Table 8.30: Distribution of "sealings and jar stoppers" by room within building I. Operation II, square V6, main tell. The four "bullae" (CO#s 2915-18) of room 3 are classified under "sealing and jar stopper".

ARTEFACT TYPE	ROOM 3 (Bu. I, V6) TOTAL	% OF ROOM 3 ARTEFACTS
Groundstone tools	36	32.14
Bone tools	3	2.68
Sealings and jar stoppers and jar stoppers (Inc. "bullae")	22	19.64
Beads and labrets	0	0.00
Pierced discs	2	1.79
Figurines	1	0.89
Spindle whorls	0	0.00
Sling missiles	7	6.25
Tokens	34	30.36
Weights	0	0.00
Whiteware	2	1.79
Misc.	5	4.46
TOTAL	**112**	**100.00**

Table 8.31: Range and number of artefacts from room 3, building I, operation II, square V6. The four "bullae" (CO#s 2915-18) are classified under "sealing and jar stopper".

CHAPTER 9: CLAY OBJECTS FROM OTHER SITES

9.1-INTRODUCTION

In addition to the three case-study sites, small geometric clay objects and sealings were examined and recorded individually, from descriptions and illustrations in publications, and from museum and archive collections (table 9.1). This tier 2 assemblage covers objects from twenty Neolithic sites; in all instances, the number of studied objects represents a mere fraction of the total known number of clay objects at each site. For most, only a limited number of objects were illustrated or described in publications, as representative examples of clay object form, and in many cases, the estimated total number of clay objects is not published. In addition, most objects within this chapter (recorded on the *Clay Object Database:* Appendix A at tier 2 level) have only limited descriptive information, and the majority have no contextual information aside from the phase, period, or level of settlement (see Chapter 5: Methodology for full details and definition of "tier 2").

The tier 2 ("museum and publication objects") sites were selected arbitrarily, according to the availably of data, and accessibility of objects. They are spread across the entire extent of the Near East (see map Chapter 4 figure 4.1) and cover the full Neolithic time span (see table 9.1). In character the sites vary, in terms of size, shape and size of structures, subsistence strategies and material culture evidenced (see individual site entries on Appendix J: Tier 3 Database). Therefore, analysis of the similarities and differences of clay objects across the range of tier 2 sites will aid in the interpretation of the information gathered from analysis of clay objects from the case-study sites, as well as adding to the understanding of the appearance evolution, function, and inter-site uniformity or not of clay object form and use.

9.2-TIER 2 STUDY OVERVIEW

A total of 1,158 clay objects have been studied at tier 2 level. Due to the limited and differing nature of the detail in the recording of these objects, basic characteristics of object form and appearance are contrasted below. More detailed, cross-site, thematic analysis follows. Full, individual details for all 1,158 objects can be found in Appendix A: the *Clay Object Database.* Additional data from the analysis of these objects is located in Appendix H.

(i) Three-dimensional Shape

Fifteen detailed and distinct three-dimensional shapes are represented in the tier 2 site

assemblage. Spheres (25.04% of the total tier 2 assemblage), type 1 cones (round base, 21.76%) and type 1 discs (21.07%) are the most common shapes (figure 9.1, figure A.H-1 and table A.H-1). Yet the diversity and proportion of different shapes represented differs markedly across individual sites. Some such as Aşıklı Höyük, Can Hasan I and Ulucak Höyük have only one or two different shapes present in their assemblage. Others (including Es-Sifiya, 'Ain Ghazal, Sarab and Jericho) have a wide range of different shaped clay objects present on site (figures 2.6, 2.7, 9.2 and 9.3. Appendix H figures A.H-2 to A.H-11 and table A.H-2). However it must be remembered that as tier 2 assemblages, the range of shapes present, and proportion of different three-dimensional shapes represented may not be a reflection of the true range of shapes found on site, unless explicitly stated by the excavator (see below for further discussion).

(ii) Craft & Raw Material

Overall, a tiny proportion, just 5.61% of all clay objects from tier 2 sites are crafted from stone; mirroring the figures seen in the case study assemblages (table 9.2). The selection of stone as opposed to clay as a raw material is significant in the interpretation of these objects: clay is abundant at the vast majority of sites in the Neolithic Near East. It is also easy to work, and well formed, simple geometric shapes can easily be crafted with little or no practice. This makes the acquisition of clay objects available to all. Stone on the other hand is not so abundant, and at some Near Eastern sites is absent altogether as a resource available in the immediate vicinity. It is more difficult to work, requiring a degree of skill, time and practice to perfect. Therefore the presence of geometrics made from stone is in itself evidence of an investment of time and skill required to crafting them. This gives stone clay objects an immediate value beyond the functional. When found alongside similarly sized and shaped clay objects, different functional uses of the two object sets may be suggested. At sites where all small geometric objects are stone (Gesher and Demirköy: 100% stone "tokens"), or represent the majority (such as Çayönü: 57.89% stone, figure 2.21), a different and distinct function of the objects at these sites as opposed to sites displaying mainly or only clay objects is likely (see table 9.2 and Appendix H figure A.H-12).

(iii) Shape Standardisation: Size, Markings & Ornamentation

Though a site may have a set of objects of the same three-dimensional shape, the size of an object and the presence of incisions or other deliberate decorative "markings" make distinct changes to the immediate appearance of a geometric object. If clay objects

acted as mnemonic devices, from as early as the Neolithic period, the presence of objects of set ranges of sizes, and of the same shape but plain and decorated ("complex") versions could point to towards a complex mnemonic system being in operation. Analysis of the shape of various spheres from tier 2 sites show that they had consistent proportions of dimensions, sharing an equal degree of accuracy in their "roundness". Yet, spheres are not found in standardised size groupings, nor sets of consistent size ranges; neither within a single site (such as 'Ain Ghazal) or across sites (i.e. Hajji Firuz Tepe and Suberde. See figure 9.4). If a *large sphere* had one meaning, and a *small sphere* had a different meaning (such as the difference in the numerical value represented by circles of different sizes seen in some number systems of 4th and 3rd millennium BC clay tablets for example), then only spheres of one or two specific size ranges would be expected to be found, not a graded range covering all sizes from 0.50 cm to 5.00 cm in diameter. The fact this is not the case suggests that there was no meaning in terms of the variation seen in sphere size.

The same is true of type 1 cones which like spheres, are found covering a wide range of sizes varying from all values from <1.00 cm to almost 6.00 cm in height and/or base width. In addition, the overall shape: the flatness or elongated nature (as seen in the proportion of maximum base width compared to height) of type 1 cones also varies significantly (see figure 9.5). Lastly 117 (10.10% of all objects from tier 2 sites) have deliberate and intentional markings. This is slightly higher than the proportion seen in the case-study sites, yet like the tier 2 Tell Sabi Abyad assemblage (see Chapter 9.2), is likely to be elevated due to the selection of the finer, more distinctive clay objects from a larger, more diverse assemblage (see later in this chapter for further discussion of markings).

9.3-THE 'AIN GHAZAL ASSEMBLAGE

-Overview

Excavations at 'Ain Ghazal began in 1982, directed by Prof. Zeidan Kafafi of Yarmouk University, Jordan and Prof. Gary Rollefson, Whitman College, USA. The main project was completed in 1998, though occasional small scale excavations are still being undertaken by Yarmouk University. 'Ain Ghazal differs from the other tier 2 sites in the number of objects studied (n=163), the fact that a selection (n=26) were studied in person, and that detailed, individual objects descriptions have been published online in *'Ain Ghazal Excavation Reports, volume 2* (edited by D. Schmandt-Besserat 2010). This includes a descriptive analysis of the 137 objects (2010a), alongside an Excel database

(2010b) detailing the various characteristics of the objects. Though it was unfortunate that a larger proportion of clay objects could not be studied in person, the detailed publication of much of the 'Ain Ghazal assemblage enabled the in-depth analysis of many varied aspects of the appearance and craft of the published portion of the assemblage. In addition, basic contextual analysis of all 163 studied objects from 'Ain Ghazal could be undertaken. As with objects from all sites, the 'Ain Ghazal assemblage was studied and interpreted from a neutral starting point. Originally studied by Iceland and Schmandt-Besserat in the 1980's, the clay objects from 'Ain Ghazal were immediately interpreted as administrative "tokens", though no published justification for this functional interpretation can be found. Full details of the 'Ain Ghazal objects and their analysis can be found in Appendix A and Appendix H. Below is a summary of the more notable aspects revealed during analysis of the 'Ain Ghazal assemblage, both the tier 1 "viewed" and tier 2 "published" collections.

9.3(a) THE GEOMETRIC OBJECTS

(i) 'AIN GHAZAL VIEWED (*TIER 1)* COLLECTION

-Shape, Size & Weight

The viewed collection (n=26) comprises a total of 10 clay (38.46% of 'Ain Ghazal viewed/tier 1 assemblage) and 13 stone objects (50%). A smaller number (7.69%) could not be definitively identified as either stone or clay (CO#s 1693 and 1695), and there is a single reused potsherd (CO# 1705) (table 9.3). A variety of clays and stones were utilised, reflected in the diverse range of colours and finish of the viewed objects. Stone examples range from bright white limestone (figure 9.6), highly polished black basalt (CO# 1694) and beige to mid-brown tones (CO#s 1708, figure 9.7). The shapes are diverse, especially considering the small sample size (figures 9.06, 9.7, 9.08 and 9.09). Rounded objects dominate overall (n=19), with spheres the most common (table 9.4). The recorded objects are small and light. Object length ranges from 1.30 cm to 4.00 cm. Weight is more variable, from the lightest at 1.40g (the lightest 100% intact object is 1.50g) up to 20.70g, with no clustering in groups in terms of weight (figure 9.10).

-Craft & Decorative Elaboration

The viewed objects are overwhelmingly well-crafted into clearly defined geometric shapes. The clay examples are generally all well finished, with a smooth exterior surface. Almost all of the objects in the viewed assemblage are in good condition and some of the stone examples appear to have been polished (such as CO# 1712). Two of

the three cones stand out from the assemblage due to their obvious similarities. They share many characteristics in terms of size, shape and finish-and together are remarkably similar in appearance (CO#s 1709 and 1717 figure 9.9 and CO# 1700). CO# 1709 is of brown clay, slightly pinched in the centre, and with a smooth finish. CO# 1717 in contrast is crafted of bright white limestone, yet in other features almost identical to CO# 1709 and CO# 1700 (also stone). All three cones stand on end unaided, and their shape makes them perfect gaming counters being easily picked up and replaced onto a flat surface.

Two of the viewed 'Ain Ghazal objects are decorated in very clear, intentional decorative incised "markings" (figure 9.11). Both are stone; one a probable natural river pebble which is small (length 1.30 cm x width 1.15 cm x height 0.90 cm) and light brown in colour (CO# 1711). The other is a much larger (base 2.30 cm x 2.25 cm and height 2.50 cm) cone shaped, white limestone piece (CO#1700). Both have extensive geometric decoration covering much of their surface, in the form of incised straight lines. The "pebble" (CO# 1711) is unlike the incised pebbles or "pebble figurines" commonly found at South Levantine Neolithic sites and typical of the Yarmukian culture, such as those found at Sha'ar Hagolan (see Garfinkel & Miller 2002a: 204-06, fig. 13.27, fig. 13.28; and Stekelis 1972: plates 45.1-5, 46.1-5, 47.1-5, 48.1-8, 50.2-3, 52.1-4, 53.1-3, 54, 55, 56, 57, 58, 60.1-6, 63.1-6, 64.1, 64.3, 68.1-3, 69.1-6, 70.1-7) and at Munhata (Gopher & Orrelle 1995: 150-163, figs. 39-45). It is much smaller in size and completely covered in simple geometric designs, rather than bearing two or three incisions mimicking anthropomorphic features, displaying the complete rendering of a human form on a pebble, or being covered in a complex web of geometric markings. The "incised cone" (CO# 1700) is even rarer, and no known parallels of this form of object have been published at Neolithic Near Eastern sites to date. Three horizontal bands are incised into the object, running around the entire circumference. In addition, four straight lines run the length of the object, evenly spaced around the sides. Rather than representing a human or anatomical element, these two incised objects appear to be purely geometric in their incised design, suggesting a symbolic meaning.

(ii) AIN GHAZAL COMPLETE COLLECTION

-Shape, Weight & Size

The total 'Ain Ghazal collection comprises 163 objects, this includes objects both viewed (tier 1), and studied from published sources (tier 2). Combined, these objects are represented by 6 of the 'basic' (figure 9.12) and 11 of the 'detailed' (table 9.5)

three-dimensional shapes. Spheres constitute 63.50% of the *published* "tokens" (n=87) and 60.12% of all 'Ain Ghazal objects (table 9.5). Type 1 cones comprise a significant proportion of 'Ain Ghazal objects, yet shapes common in other assemblages (ovoids, semi-ovoids and semi spheres) are almost absent. The average object weight at 'Ain Ghazal is high in comparison to the case-study assemblages, at 6.68g, and with a minimum weight of 1.10g (a complete object made of clay). 78.08% (n=114) of all 'Ain Ghazal objects weigh less than 10.00g, and 89 of these fall between 2.00-7.99g in weight (figure 9.13). Both complete and damaged objects cover the same range of values. There is no correlation seen across three-dimensional shape, weigh and raw material (figures 9.14 and 9.15). Whilst the 'Ain Ghazal clay object assemblage exhibits a wide range of weights, dimensions are far more restricted (figure 9.16). The majority of studied objects fall between 2.00 cm to 2.99 cm in length (52.15%) (figure 9.17). Likewise, more than half (62.22%) measure <3.00 cm in width, and the majority stand at a height of between 1.00 cm to 1.99 cm (Iceland: 'Ain Ghazal online excavation report: Chapter 1 and Appendix to Chapter 1).

-Craft, Technical Characteristics & Decorative Elaboration

In addition to the objects viewed in person, all (n=137) published objects from 'Ain Ghazal were assigned to one of seven a technical categories; detailing clay colour, texture, finish and inclusions (table 9.6). The majority fall into category 3; clay described as "coarse…pale brown…marl and chert and charred organic material…" (33.74%) or category 4 "dark greyish brown [clay] containing coarse marl and chert and charred organic material…" (tables 9.7, 9.8 and figure 9.18). In addition to the 2 incised 'Ain Ghazal "tokens" above, 15 of the published "tokens" are described as also having intentional, decorative markings. Shapes include cones (n=1), spheres (n=10) and discs (n=3). The style of decoration (where published in detail) is not diverse with three variations: "grooves" (straight, independent lines, generally single only), parallel lines ("punctuations") or circular holes (table 9.9)-(Iceland 2010a & 2010b).

9.3(b) 'AIN GHAZAL CONTEXT

(i) NEOLITHIC PHASE (TIER 2 OBJECTS)

'Ain Ghazal was occupied for over two millennia, and the site's clay objects (including the few 'Ain Ghazal small geometric examples of stone) are found in levels spanning almost 1,000 years. Though none of the *viewed* (tier 1) objects have contextual information relating to phase beyond the broad Neolithic, the n=137 *published* clay objects can all be assigned to a sub-phase. 96.35% (n=132) of 'Ain Ghazal's *published*

(tier 2) assemblage date to the PPNB. Of these, almost all of them, n=129 (94.16% of the published total) are from levels dated to the *Middle* PPNB (MPPNB), with only 3 coming from *Late* PPNB (LPPNB) levels. A single example comes from the PPNC and one from the Yarmukian phase of settlement (see figure 9.19) (Iceland 2010a).

(ii) MIDDLE PPNB SUB-PHASES (TIER 2 OBJECTS)

The MPPNB at 'Ain Ghazal (c. 7,200-6,500 BC *un*calibrated) is divided into 5 sub-phases (I to V), each lasting approximately 100 years. MPPNB I to V are each further sub-divided into "sub-sub" phases (a, b, c, d) within each numbered sub-phase (i.e. MPPNB IIa). There is a clear differential presence of clay objects within certain stages of the MPPNB. 115 of the 129 MPPNB clay objects can be assigned to a sub-phase. The majority of which (n=69), come from MPPNB sub-phase IV (60.00% of the n=115 assignable objects), dated to c. 6,900-6,800 uncalibrated BC (figure 9.20). More specifically, almost all of these, n=60, come from a single sub-sub phase within it, MPPNB IV"a" (see table 9.10). Considering three-dimensional shape and MPPNB sub-phase (MPPNB I-V), slight changes can be seen in the presence and proportion of different shapes across each 100 year time block. Spheres remain the largest proportion of objects in all MPPNB sub-phases, yet decline slightly through time (figure 9.21). Type 1 cones are absent in MPPNB sub-phases II and V, yet constitute significant proportions of sub-phases III (11.43% of all MPPNB III clay objects) and IV (10.14% of all MPPNB III clay objects). Clay objects also become slightly larger through time across each MPPNB sub-phase (figure 9.22).

(iii) AREA OF SITE & CONTEXT TYPE

This information was available for all 163 clay objects from 'Ain Ghazal. More than three quarters of clay objects come from the "Central Field Area", with less than 20% coming from other site areas (figures 9.23 and 9.24). The Central Field Area was the earliest and most extensively excavated location within 'Ain Ghazal, forming the basis of the projects main excavation seasons. Thus a greater volume of material hails from this area. Sieving was also utilised at the 'Ain Ghazal excavations most extensively in these early, Central Field Area excavation seasons, where all material dates to the MPPNB (Iceland 2010a, 2010b). Therefore a clear bias in the number of objects across different site areas is present.

118 of 'Ain Ghazal clay objects have a description of their context. Of these, the largest proportion come from "ashy fill" layers (excluding pits); n= 34 (20.86% of all studied

objects) (figure 9.12). The next four most common context types all contain similar numbers of objects: "floor surface" (not associated with a room, thus excluding "room surface" and "room fill") objects number 16 (9.82% of all recorded objects), "ash pit" (fill of) objects number 14 (8.59%), "FCR fill/pit-fill" (n=13, 7.98%) and "debris/trash/trash fill/rubble" layers (also 7.98%) (figure 9.25). Most of the context types are secondary rather than primary deposits and none of the objects are recorded as being found *in situ,* or in association with other artefacts.

9.3(c) 'AIN GHAZAL SUMMARY

The clay (and stone) objects of the 'Ain Ghazal assemblage; though well-crafted into clearly defined and standardized shapes, and represented in a range of stone types as well as clay, does not comprise a single uniform set (or many clearly distinguishable sets) of objects. The similarity of shape and finish between two semi-spheres (CO#s 1693 and 1701-figure 9.7), and the two cones (CO#s 1709 and 1717-figure 9.9), from the viewed assemblage is notable; yet with only two examples of each, the presence of distinct and clearly identifiable "sets" of objects is absent. A combination of stone and clay was utilised to craft the geometric objects from 'Ain Ghazal, with objects present in a wide range of contrasting colours-which in addition to three-dimensional shape, may have served to differentiate objects from one another when used as a group. The presence of a number of examples with bold markings is another notable way of distinguishing clay objects from one another and therefore diversifying the 'Ain Ghazal assemblage significantly.

As none of 'Ain Ghazal's published clay objects are reported as being recovered *in situ*, the context in which they were used, or intentionally placed in after their useful life is unclear. However, in general they are reported as mostly coming from ashy layers in open spaces (similar to the middens of the first two case-study sites), and a few from buildings, mirroring the patterning seen at Boncuklu Höyük and Çatalhöyük, and also at Tell Sabi Abyad (in the type of content they come from, though not in the proportion found in each). In site structure and layout, MPPNB 'Ain Ghazal shares some similarities with Çatalhöyük, encompassing rectangular "corridor" houses with plenty of internal storage capacity, and separated by open spaces (Rollefson *et al.* 1992: 448). Therefore the similar broad contexts from which clay objects are found, despite the vast geographical distance between the two sites could suggest a common function of clay objects. The distribution of 'Ain Ghazal's clay objects by phase and date also shows an intriguing trend. 'Ain Ghazal's clay objects are limited almost entirely to a single period

of the Neolithic: the Middle PPNB. Though biases in excavation strategy may explain the restriction of almost all of the site's clay objects to the MPPNB period, the aggregation of the majority of 'Ain Ghazal's MPPNB clay objects in one specific "sub-sub-phase" of it (IVb approximately a 30 year time span between 6,900-6,800 uncal. BC) cannot be ignored.

9.4-OTHER TIER 2 SITES

9.4(a) COLLECTIONS STUDIED IN PERSON

(i) Tell Arpachiyah

Tell Arpachiyah is a Late Neolithic site located in the Halaf "cultural zone" (Chapter 3.3), just east of the Tigris River in the Fertile Crescent. Occupied over the 6th millennium c. 5,800-5,000 cal. BC, Arpachiyah's Halaf levels reveal both geometric clay objects and sealings. The total number of geometric clay objects excavated at Tell Arpachiyah is unknown (as is the total number of other finds, and the detail of their context, see Campbell 20-0b: 4-5). A least 11 stamp seals and 27 sealings were recovered from Mallowan's original 1933 excavations, the majority of these come from level 6 of the summit, the TT ("top of tell") area of the site (see Chapter 3.7 and Campbell 2000b: 13, 17, 32-4). Twenty geometric clay objects housed in the British Museum (CO#s 879-899) were recorded in person, selected from an examination of all small clay objects from the museum's Tell Arpachiyah collection (including objects registered as "tokens", "sealings", "net sinkers", "net weights", "miniature vessels", "toy", "dish", "bowl").

Seven of the twenty recorded clay objects (CO#s 881-887) are extremely similar in shape and craft. All are cone shaped; with flat bases, circular in plan view, with a squat (short and wide) triangular shape when viewed from the side. All stand easily on one end, and are remarkably uniform in size, in addition to shape. All Tell Arpachiyah cones are finely crafted and well finished, burnished in mid-brown or drab grey coloured clay (figure 9.26). In addition to the cone-shaped "tokens", two additional Tell Arpachiyah objects were studied (CO#s 893-94). These again were small, geometric clay objects, yet pierced through their length; possible beads. In their care of craft, clay fabric and size, they are similar to the cones, yet both CO#s 893 and 894 are decorated over their entire external surface in detailed, parallel incised dashes (figure 9.27). In addition to geometrics, five sealings bearing stamp seal impressions (CO#s 890-892 and 898-899) each different in form, finish and impressions (figure 9.28), and a number of solid,

conical items (figure 9.29) covered in stamp seal impressions were also studied (see Appendix A).

The overwhelming majority of the studied Tell Arpachiyah objects appear to come from a single building- the "TT6 Burnt House" (see Chapter 3.7 and Campbell 2000b: 2-25 for full description). Dating to c. 5,300 cal. BC, this building was situated in a strategic location, at the top of the tell, and bears many similarities to the burnt building in V6, Tell Sabi Abyad operation II (Campbell 2000b: 2, fig. 1 p. 3). It contained over 150 finds, distributed over just two of the building's rooms (Campbell 2000b: 2). These include extremely fine, intricately decorated polychrome ceramics, stamp seals, sealings and figurines. Contextual data (aside from broad phase) was not available for much of the studied collection, however, it would be reasonable to assume that like many of the Neolithic objects at the site, some, if not the majority of studied objects also came from the TT6 Burnt House (see Campbell 200b: 2, 7 and "catalog" for discussion of the distribution of the "TT" Halaf phase finds). This has important implications for the role of clay objects at Tell Arpachiyah. The function and ownership of the building in TT6 is a matter of speculation, however the placement of clay objects in a undoubtedly important and symbolic building, alongside many other finds: all highly crafted and therefore with intrinsic and as well as perhaps ritual or symbolic value (such as the figurines) suggests that along with their form, Arpachiyah's clay objects, far from being mere doodles, toys or meaningless lumps of clay were important and valued items. Their value may not have been related to their skill of craft, nor raw material-but in the meaning imbued onto them.

(ii) Tell Halaf

There are many similarities between the 7 objects studied from Tell Halaf and Tell Arpachiyah, as well as the sites themselves. Tell Halaf was occupied for much of the same portion of the Neolithic as Tell Arpachiyah; and as the type-site of the Halaf "culture" (see Chapter 3.3), shares many similarities in terms of site layout and material culture (see "Tell Arpachiyah" and "Tell Halaf" entries in Appendix K for full site details). With Tell Halaf located on the Khabur River, both sites are also located in close geographical proximity (see figure 4.1). The five cones (CO#s 876-900) recorded from Tell Halaf are of good craftsmanship, and in well-defined geometric shapes, based around the cone shape (see Appendix A). A number of small fragments of probable sealings; displaying stamp seal impressions and rope impressions on the reverse sides have also been identified (CO#s 901-02, figure 9.30).

(iii) Discussion

The studied assemblages of objects from Tell Halaf and Arpachiyah are of a remarkably consistent shape, manufacture and high quality. The similarity of objects, form and craft across the two sites is not surprising considering both their temporal and geographic proximity. They also share many similarities to the assemblage of Tell Sabi Abyad (see Chapter 8 and Appendix F). As "Halaf" sites, these two, in addition to the Late Neolithic at Tell Sabi Abyad are thus labelled due to their shared cultural characteristics, and therefore it is not surprising that this transcends into the sphere of sealings and clay objects. Tells Halaf, Arpachiyah and Sabi Abyad are unlikely to have had much direct interaction, however they formed part of a regional network stretching across the arc of the Fertile Crescent in the 6th millennium BC. This network was one of a shared stylistic material culture.

Differences between sites (e.g. on-site activities, density of structures and shape of buildings and the addition or not of storage annexes attached) are also a feature of Halaf sites. Therefore although clay objects at both Tell Halaf and Tell Arpachiyah (also 6th millennium Tell Sabi Abyad, operations I and II, Chapter 8) appear to have been used in conjunction with sealings, the actual operation of this clay object-sealing system cannot be assumed to be identical and have worked in the same way across these Late Neolithic, North Mesopotamian settlements. It is tempting to interpret the clay objects from Tell Halaf and Tell Arpachiyah as part of an administrative system, with clay objects stored for some time during or after a transaction had taken place. Likewise, there is strong evidence for clay objects and sealings, at least in certain phases and areas of settlement at Tell Sabi Abyad, as having operated in the administrative sphere. Yet exactly how this worked, and what was being counted or accounted, by whom and for what purpose is still uncertain, in part due to the lack of clear contextual evidence for the exact find spots of the items, and associated objects.

9.4(b) OBJECTS ILLUSTRATED IN PUBLICATIONS

(i) Overview

The sheer diversity seen in many aspects of the presence, distribution and range of clay objects in circulation during the Neolithic Near East is illustrated by the close examination of additional tier 2 sites and their clay object assemblages. It is extremely difficult to accurately quantify, or even estimate the number and density of clay objects at each site studied. The proportion of each site excavated, estimated site size and the duration of its Neolithic occupation (and changes in site size over this time) all affect

which proportion of a sites total clay object assemblage will be recovered from excavation. Furthermore, the nature of the matrix, excavation techniques (including the use and extent of dry sieving and floatation), archaeological recovery practices and the aims of each excavation (the types of materials and finds sought and recovered. An excavation focusing on the wide exposure of architectural remains for example might not be so focused on the collection, recording and publication of all small clay finds compared to one which pays particular attention to the reconstruction of the past environment and the adaptation of agriculture) all effect the recognition, recording and recovery of clay objects at a site. However, the case-study sites cannot be interpreted in isolation, the Neolithic of the Near East was inter-connected, with exchange networks covering the entire zone and beyond (see Chapter 3). Therefore, the examination and comparison of sites with and without clay objects, and a study of the types, diversity, context and approximate number of clay objects at the sites where they are reportedly found will aid in an assessment of their function, use and changes in their role over the Neolithic period.

(ii) Diversity

Tell Kurdu, an extensively excavated site of the 6th millennium cal. BC has revealed a total of only 5 sealings, and 24 clay objects (figure 9.31). This is despite the site being contemporary with, and in fairly close proximity to the sites in the Halaf cultural zone (a characteristic of which is the presence of clay objects and sealings, see map figure 4.1 for site location). The low number of clay objects from Tell Kurdu cannot be attributed to retrieval processes due to the employment of 100% dry sieving of almost all Neolithic contexts (Braidwood, Braidwood & Haines 1960; Özbal *et al.* 2004: 61, 84, fig. 13 p. 104, fig 15 p. 106; Gerritsen & Özbal 2003; Yener, Edens, Casana *et al.* 2000; Yener, Edens, Harrison *et al.* 2000). The site of Jarmo, in contrast, has revealed more than 2,400 clay objects of a huge variety of different geometric shapes (see figure 9.32 and table 9.11). This is despite the fact that the site was subject to just one excavation season in 1960 (by Robert and Linda Braidwood, the same original excavators of Tell Kurdu) and just 10% of the estimated total site being excavated (Braidwood, Braidwood & Haines 1960, Braidwood 1983, Broman Morales 1983).

Clay objects appear right at the start of the Neolithic period in the Near East; many of Jericho's clay objects date to the earliest phase of occupation (PPNA levels c. later 10th and 9th millennium cal. BC) (table 9.12, figures 2.6 and 2.7). Likewise, the tiny (two settlement areas measuring 21 m^2 and 18 m^2) 10th millennium (c. 9,300 cal. BC) site of

Gesher contains geometrics (albeit a very small number). Interpreted as a semi-permanent hunter-gather camp site, due to the lack of domesticated animal and plant species, and a faunal assemblage comprising 39% mountain gazelle (*gazelle gazelle*); this site demonstrates only one short phase of occupation in each of it's two areas, lying abandoned from the latter part of the 10th millennium cal. BC (Garfinkel & Dag 2006: 11, 17-18, 38, 42, 159-60, 187, 190-91). Despite its small size and short duration of occupation, all excavated sediment was sieved through a 2mm mesh, revealing the presence of clay objects (figure 9.33; Garfinkel & Dag 2006: 14, 37). Clay objects are found all over the Near East, from sites such as Ulucak Höyük in western Anatolia, across central and eastern Anatolia, as far east as the Zagros Mountain ranges (at sites like Jarmo and Sarab), and into the Jordan Valley of the southern Levant at 'Ain Ghazal and Es-Sifiya (see map Chapter 4, figure 4.1).

(iii) Range of Shapes & Styles

The range of shapes present within a single site does not become more diverse over the course of the Neolithic. Nor do "complex tokens" or clay objects displaying markings remain absent from the Neolithic record (and for a further 2,000 years, in opposition to the argument put forward by Schmandt-Besserat 1996: 16-17; Schmandt-Besserat 1992a: 36, 37, 49). One of the earliest studied sites, Gesher, has small, stone geometric objects decorated with incised grooves which date to c. 9,300 cal. BC (figure 9.33). Sites such Sarab, Tell Arpachiyah, 'Ain Ghazal, Jericho, Salat Cami Yanı display a wide range of geometric clay object shapes, despite them hailing from a diverse range of geographical locations and Neolithic time periods (figures 2.6, 2.7 and 9.12, figures 9.34 to 9.38, tables 9.5, 9.12, 9.13). Others including Es-Sifiya, Aşıklı Höyük and Ulucak Höyük and are equally as diverse, yet all display clay objects in a far more limited range of shapes (figure 9.39).

(iv) Object Uniformity

Shape uniformity is of integral importance if different shaped and sized objects had different functions and meanings. The degree of uniformity, as with the case study site assemblages (see Chapters 6, 7 and 8) varies across sites, and where strong-is generally strong within a select set of objects within a more varied three-dimensional shape category. The cones from 6th to early 5th millennium cal. BC Ulucak Höyük, appear to be remarkably uniform in shape, size and fabric (see figure 9.39), however it is unclear if the cones on display at the Izmir museum (figure 9.39), and published thus far represent all cones recovered, or only a selection of the more fine examples. Clearer

examples of shape uniformity (though as stated above, within a larger, more diverse geometric assemblage) is seen at Çayönü where it is reported that 22 identical "pawn-shaped" objects were recovered (figure 2.21 and table 9.14) (Çambel & Braidwood 1979: 149 lower fig. b).

Uniformity of technology of clay objects is also evidenced at many sites, supporting the notion that clay objects were intentionally crafted object category, cohesive and with a clear and distinct purpose. This is evidenced in the clay objects studied at the British Museum (see Tell Arpachiyah and Tell Halaf sections above), and also at Hajji Firuz Tepe where different clay types were selected for the manufacture of different types of small clay artefacts (Voigt 1983: 168) (table 9.15). Es-Sifiya evidences the co-manufacture of geometrics, zoomorphic and anthropomorphic figurines with all three artefact categories displaying not only identical technological characteristics, but a shared symbolic and contextual relationship (see below for discussion of context. Mahasneh & Gebel 1998: 105).

(v) Context of Clay Objects

Where clay objects are recovered on-site: the restriction of clay objects to certain phases of occupation, areas of the site, and their association to certain features or artefacts; points to them functioning together as a group of artefacts. At Çayönü, the 22 stone, "pawn-shaped" objects referred to above were all found deposited together as a single cache. Dating to the site's Cell Phase (approximately c. 7,000-7,200 BC), the cache was recovered from inside a house at the east side of the settlement. Houses in this area of the site are all larger than contemporary houses on the west side of the settlement. In addition, all of Çayönü's imported raw materials, as well as finished goods came from houses in the east of the settlement (Çambel & Braidwood 1979: 149 lower fig. b; Hole 2000: 200). This explains to a degree, the presence of a significant proportion of stone as well as clay geometrics, and suggests geometrics were high valued items-utilised by more fortunate members of the community; those with access to imported materials and residing in larger buildings (perhaps part of larger, more influential corporate or kin-based groups).

Similarly, at 6th millennium cal. BC Hajji Firuz Tepe, in the Zagros region, though found in all phases, the clay objects are most commonly found in a distinct phase of settlement; Phase D of Operation V (see table 9.16). These clay objects-all cones were recovered together, on the floor of structure VI (figure 9.41), in association with Burial

3 c. 5,812 cal. BC (CO#s 1963-68, Voigt 1983: 548-49). They are also found in distinct contexts compared to that of sealings at the site (table 9.16b and individual Hajji Firuz object entries in appendix A; Voigt, 2000: 265). Comparable evidence, also hinting at a ritual function of clay objects comes from Höyücek in the Anatolian Lake District. Occupied over three Neolithic phases; "Early Settlements Phase", "Shrine Phase" and "Sanctuaries Phase" (see table 9.1), clay objects are found in modest numbers (<=25), yet only in the Sanctuaries Phase (early 6th millennium cal. BC). Höyücek's Sanctuaries Phase is characterised by the building of open air religious structures on virgin soil, and an apparent lack of domestic dwellings (Duru & Umurtak 2005: 225, 243, 164-67, 173-76). The buildings or platforms of this phase, contained large numbers of finds or "ritual" objects including clay "idols", figurine heads of clay, complete figurines of stone and clay, pot stands and ladles (see Chapter 3 figure 3.15). Geometrics clay objects of various shapes are only present in the "First Sanctuary" (see description in table 9.17). Interpreted as offerings left to the gods, Duru and Umurtak (2005) feel these small clay objects were certainly intentionally placed, in a deliberate act and symbolic location within this distinctive phase of settlement-in which Höyücek acted as a pilgrimage site, -a religious cult centre consisting only of open air platforms (2005: 174-77). Clay objects are lacking from the second sanctuary.

Though the context of Höyücek's clay objects may indicate a ritual function, the interpretation of Höyücek's Sanctuary Phase as a non-residential, pilgrimage site, visited by villagers of the Burcak plain, for religious ceremonies only is debatable (Duru & Umurtak 2005:177). The Sanctuaries Phase was built on virgin soil, rather than on top of the buildings of earlier phases, however the presence of walls, and many *in situ* architectural remains (Duru & Umurtak 2005: 175) within this final Neolithic phase contradicts the excavator's interpretation of the Sanctuaries Phase as a series of open-air cultic platforms (Duru & Umurtak 2005: 174-75). Furthermore, both the Sanctuaries Phase, and the proceeding Shrine Phase yielded equal proportions of faunal remains including a number of domesticated species (Duru & Umurtak 2005: 205), incompatible with the diverse interpretation of these two phases. It seems more likely that the concentrations of geometrics and other "ritual" items represent the dumping of refuse into external, open air middens and work platforms within a small village settlement. This parallels the context of the majority of clay objects at Boncuklu Höyük and Çatalhöyük (see Chapters 6 and 7). Yet their association with many ritual items (see figure 3.15), the wide variation in shape of the clay objects, and the corresponding variation in figurine size, pose and decoration (many have incised decoration, as do

some of the clay objects) suggests a highly symbolic meaning was attached to Höyücek's clay objects, and a function likely linked to ritual practice.

A number of 7th and 6th millennium sites in central Anatolia display (direct and indirect) evidence of storage in the form of upright cylindrical silos or compartmentalised square/rectangular storage bins (table 9.18 and figures 3.5 and 3.6). The installations at Höyücek, Bademağacı and Hacilar in particular all bear remarkably similar style, and construction techniques (figure 9.41). Those at Suberde are found in all l three levels of settlement, and a total of 59 clay objects published from this site (Bordaz 1968: 46-47, fig 6; Bordaz 1966: 32; Umurtak 2007: 5). The installations at Höyücek all come from the Shrine Phase (no clay objects reported from this phase of settlement) and many contained large numbers of sorted, separated grain of various kinds, as did the installations at Hacilar, strongly suggesting that at Suberde too, the silos were used to store grain (Umurtak 2007: 2-5) (table 9.18). If the residents of all four sites were reusing multiple, large capacity, immovable storage silos to store grain, clay objects may plausibly have been used in order to administer this grain. This could have been done in various ways-such as each clay object symbolising one share or measure of grain being entered into or removed from a silo. With a handful of clay objects kept together as a record of the number of shares either currently being stored in a silo, the number of shares having been removed (in a particular season or time frame) from a silo, or given by one person to another, in exchange for a share of grain. It seems that different ways of accounting for grain were required and utilised at these four sites; all close in time period and geographical location, as at each, the presence of clay objects from levels contemporary to the silos, the number of silos and storage capacity (relative to the number of domestic structures, and the location of the silos (in open, communal areas in-between buildings, or inside the more private space of a building) varies (Umurtak 2007: 4-5, 7-8) (see figure 9.42 and table 9.18).

9.5-TIER 2 SUMMARY & DISCUSSION

The evidence of clay objects recorded at tier 2 level: "museum and publication objects" greatly aids in the interpretation of the distribution, form and possible function of clay objects in the Neolithic Near East. This brief survey of the number and type of clay objects found at sites across the region shows that far from being limited in distribution, clay objects are found across the entire region, and duration of the Neolithic period, from its beginnings and well into the end of the period. Furthermore, there is no patterning in terms of the relative number, range of shapes, or other

indicators of assemblage diversity (colour, size, presence of markings, raw material with stone as well as clay examples). Nor do these characteristics show any correlation to site size, on-site activities or subsistence strategies; being found at small, semi-permanent hunter-gather camps, non-residential "ritual centres" and 20 hectare mega sites alike. Though extensive in temporal and geographic distribution, the diffusion of clay object technology and use remains unclear. Clay objects are absent at some sites (see Chapter 10, table 10.3 and Appendix J), and no evolution in their distribution or form is apparent.

At all tier 2 sites studied, clay objects are well crafted, and intentionally made, seen in both the definition and standardization of shape, object finish, the selection of specific types of clay for certain shapes, or small clay artefact types, and the use of stone in a number of instances. Spheres, discs and comes are by far the three most dominant shapes. Unlike at the case-study sites, cones (all sub-types combined) dominate the tier 2 recorded sample at 30.22%, with spheres the second most common shape (25.04%) and discs (all sub-types combined) the third (23.14%)-(figure 9.1 and table A.H-1). The diversity of shapes, and proportion of each present within a site's assemblage, varies significantly across the tier 2sites, with spheres comprising the majority of shapes within some assemblages, 'Ain Ghazal and 'Es-Sifiya for example (figures 9.12, 9.21 and 9.38). It must be remembered that the recorded sample does not reflect the entire known clay object assemblage at all sites, Sarab for example recorded a total clay object count of 2,400 "shaped pieces" yet the shape of only 441 is published (27.89% "flattened disc", 17.91% "small balls", 17.23% "cones" and 0.91% tetrahedrons), and only 37 of these objects were published in enough detail to be recorded on the *Clay Object Database* (with the recorded sample therefore evidencing shapes in the following proportions: 10.81% "flattened disc", 8.11% "small balls", 24.32% "cones" and 10.81% tetrahedrons, table A.H-8). Despite this, there is a clear presence of "sets" of clay objects of specific and varied shapes at many tier 2 sites. In most instances, these sets centre around the three most common shapes cited above; Cayönü (cones and discs), Es-Sifiya (spheres and cones), 'Ain Ghazal (c. 80% spheres, cones and discs combined; figures 9.12 and 9.21), Sarab (discs, comes and spheres), Jericho (cones, cylinders, spheres and discs; figure 9.36, also figures 2.6 and 2.7), Jarmo (spheres, Discs and cones) Ulucak (discs, cones and spheres), and Suberde (cones, cylinders and spheres) for example. This diversity of clay object assemblages within many tier 2 sites, can be presented as good evidence against the gaming interpretation. The context of clay objects in many instances also supports this assertion.

Far from being mere doodles in clay, clay objects appear to be considered and carefully produced artefacts in the Neolithic. Where noted, their contexts mirror that of clay objects from the case-study sites. The diversity in the type of sites clay objects are found at, as well as in the detail of the composition of clay object assemblages when compared to one another, opposes the claim that clay objects were part of a consistent, and coherent, inter-site system-utilised across the entire Neolithic Near East, and into the proto-literate period. Even across sites located in close proximity to one another, with contemporary occupation, little evidence of the same functioning of clay objects is evidenced. Comparable sets of clay objects, in terms of the number, presence and proportion of clay objects of different and distinctive shapes, sizes and decoration would be needed to prove the theory of a Near Eastern-wide, set system of use, and presently the evidence does not support this claim. Rather, the independent use of clay objects, likely used in groups, yet in various different spheres of village life is plausible.

ILLUSTRATIONS

FIGURES:

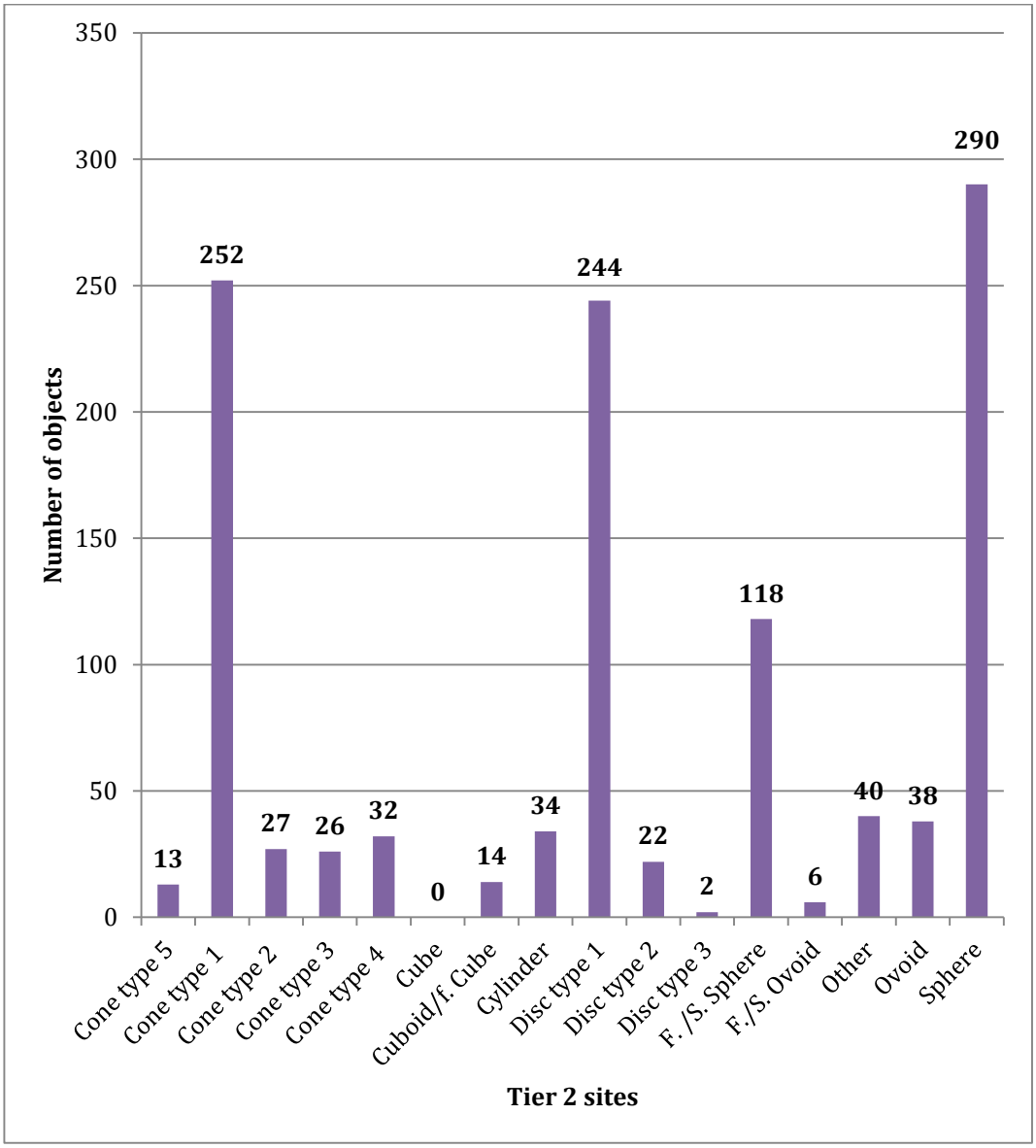


Figure 9.1: Detail of the three-dimensional shape (as assigned during analysis, not necessarily as published) of all tier 2 objects combined. See individual entries in Appendix A (*Clay Object - Database*) for references.

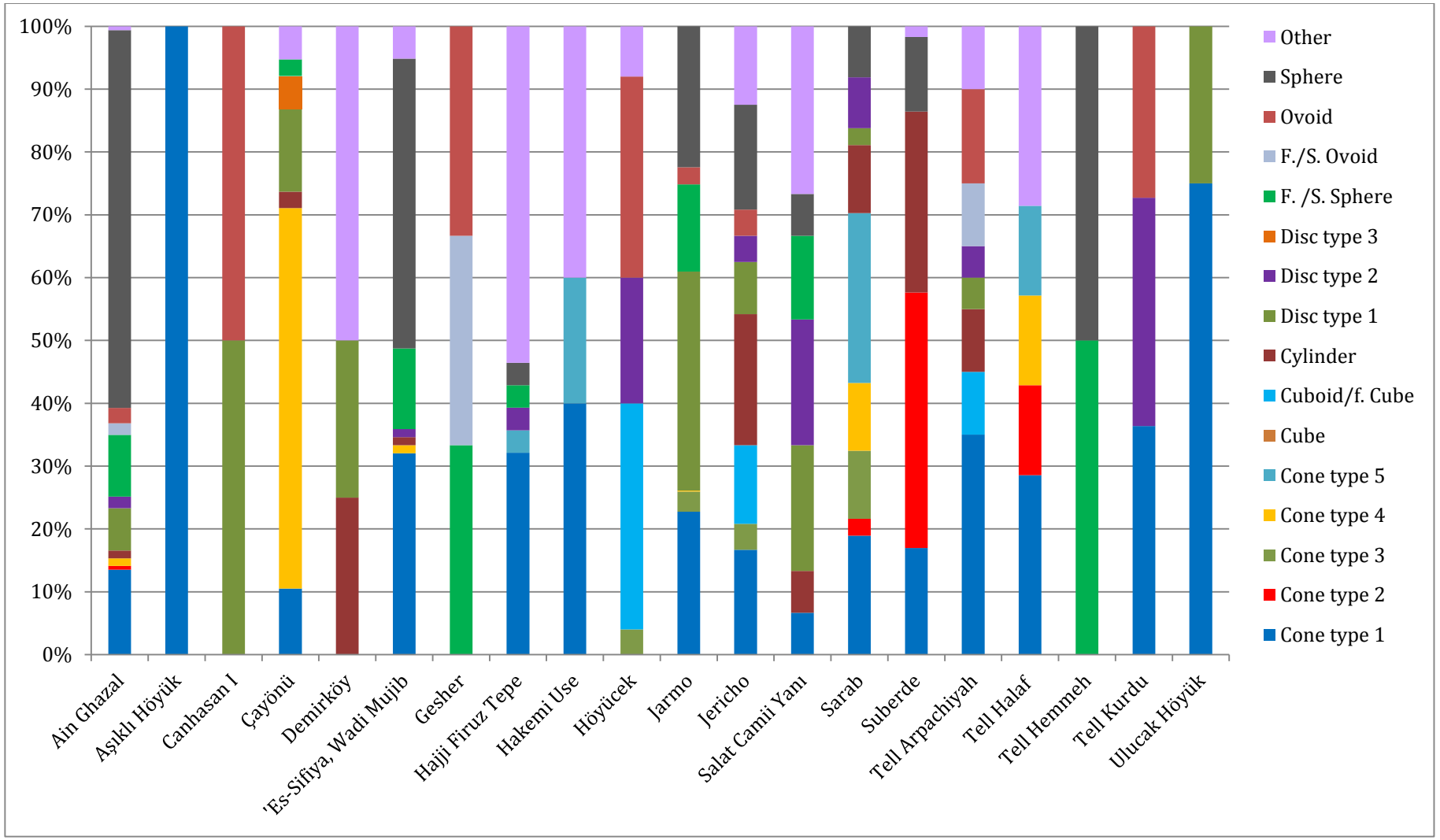


Figure 9.2: Diversity of three-dimensional shapes represented in the assemblages of each tier 2 site. See individual entries in Appendix A (*Clay Object - Database*) for further details.

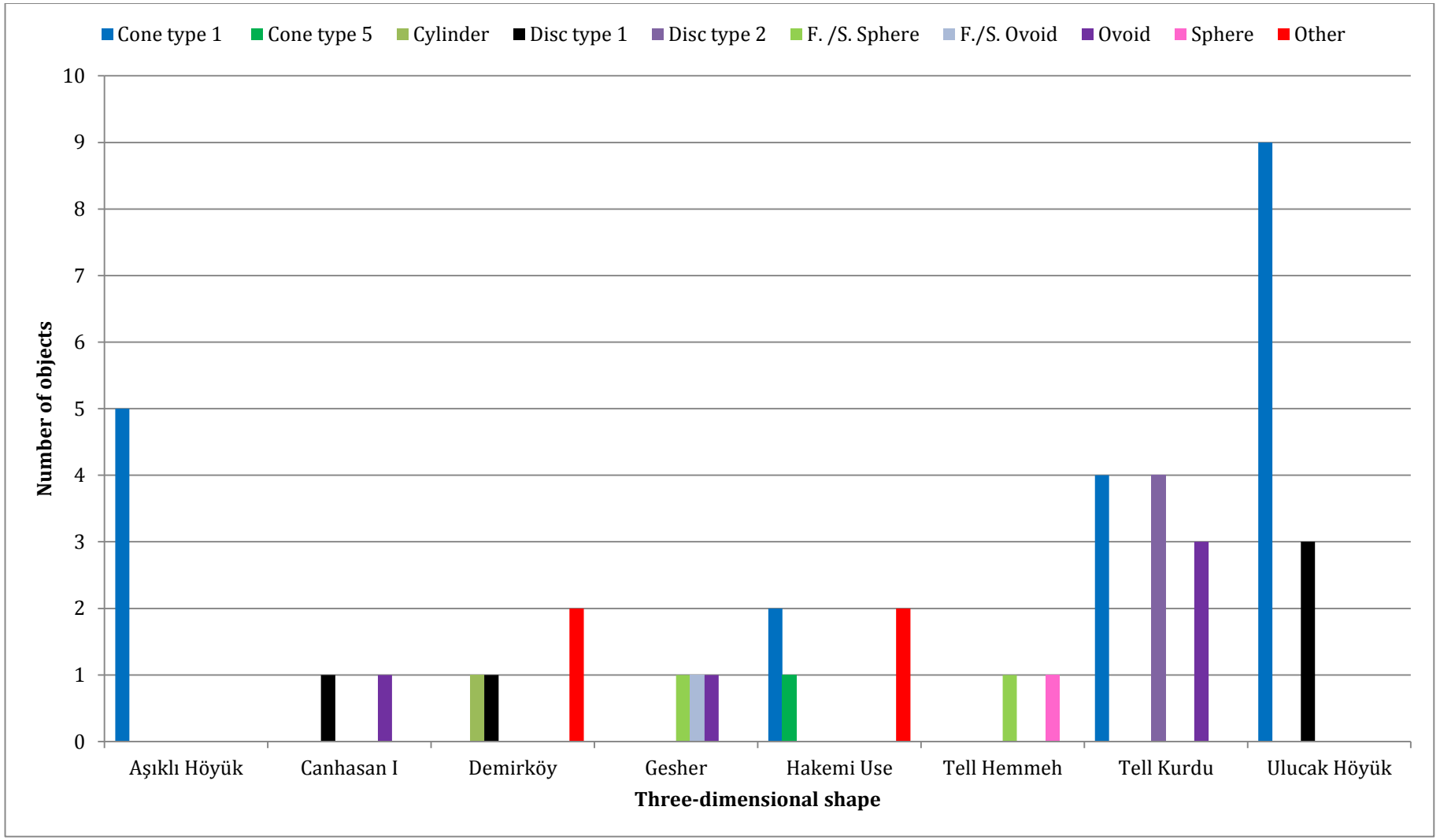


Figure 9.3: Detail of the diversity of three-dimensional shapes (as assigned during analysis, not necessarily as published) at select tier 2 sites (see Appendix F for more detailed charts).

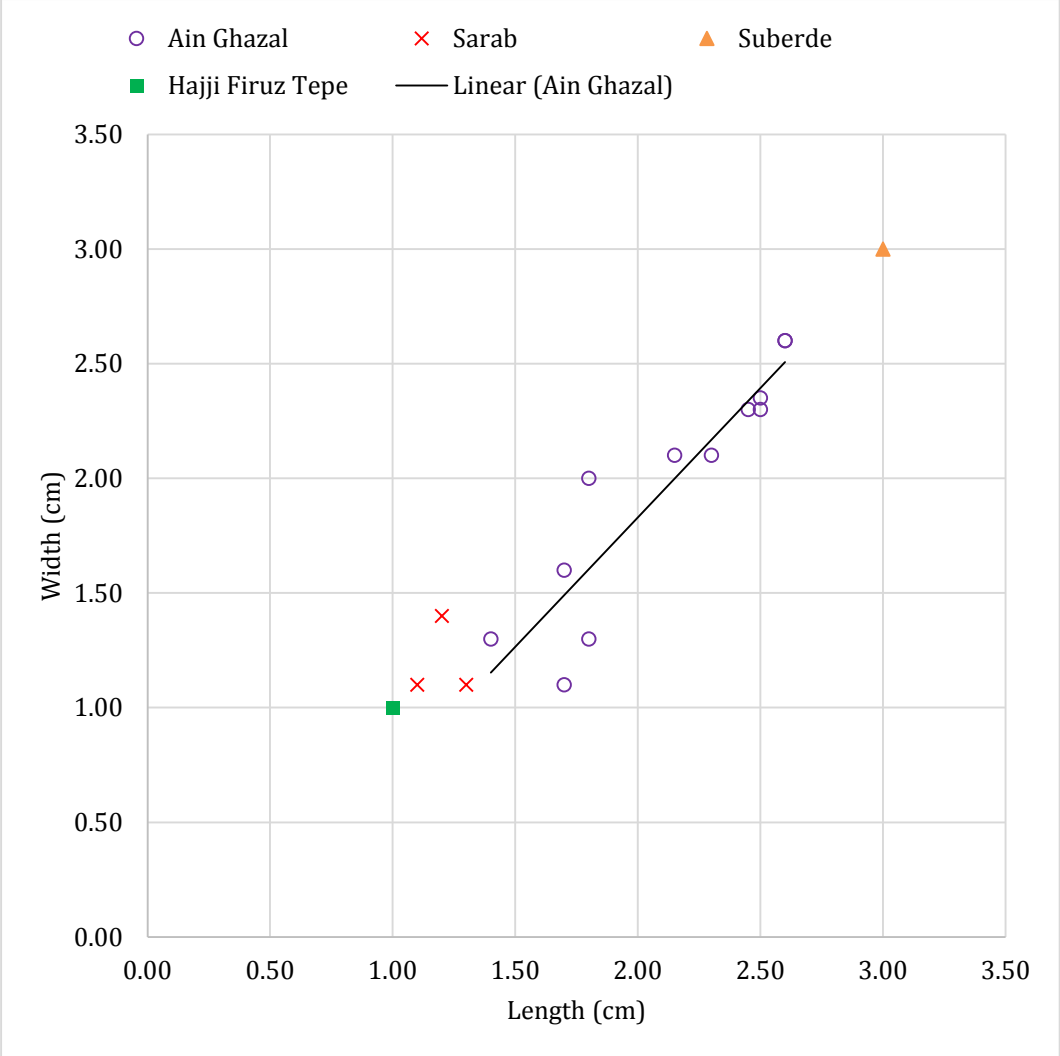


Figure 9.4: Dimensions of spheres (plan view length and width: maximum and minimum diameter) showing range of sizes, and the degree of standardization of spheres within and across tier 2 site assemblages (all tier 2 sites with a total clay object sample size of >20 objects with dimensions published, total n=17 objects). See individual entries in Appendix A (*Clay Object -Database*) for references.

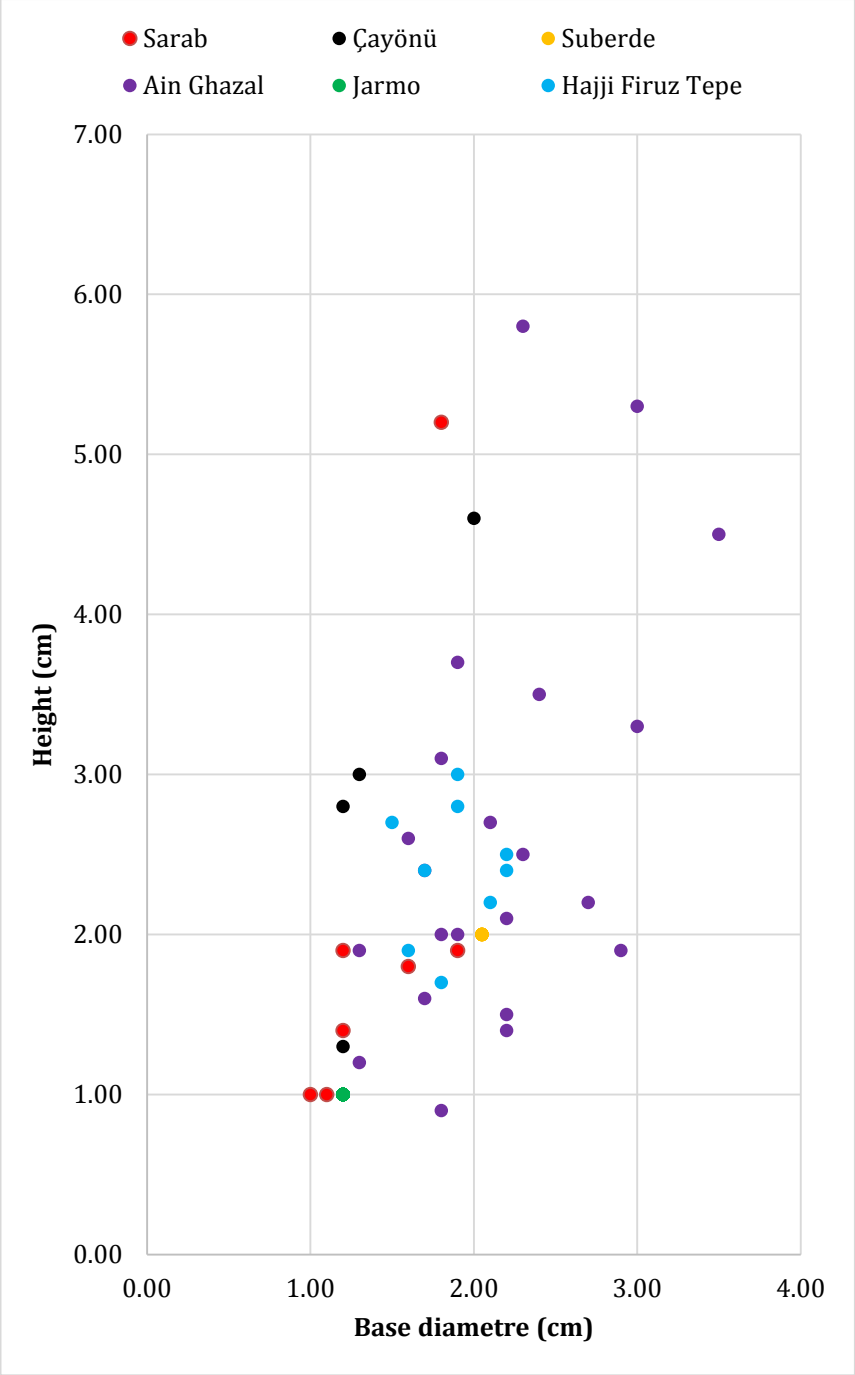


Figure 9.5: Dimensions of type 1 cones (height and plan view length-base diameter) showing the degree of standardization of cone sizes and proportions within and across tier 2 site assemblages (all tier 2 sites with a total clay object sample size of >20 objects with dimensions published, total n=158 objects). See individual entries in Appendix A (*Clay Object -Database*) for further details.

Figure 9.6: Selection of limestone objects, each displaying the same distinct, smooth, bright white finish (left to right, CO#s 1715, 1716, 1718 and 1717). (Photograph's: author's own, courtesy of Z. Kafafi and G. Rollefson of the 'Ain Ghazal Project).

Figure 9.7: Semi-Spheres; identical in shape despite the evident differences in raw material, colour and size (CO#s 1708–left and 1714–right). (Photograph's: author's own, courtesy of Z. Kafafi and G. Rollefson of the 'Ain Ghazal Project).

Figure 9.8: Selection spheres from the total of 11 that were viewed (left to right, top to bottom: CO#s 1693, 1697, 1694, 1701, 1712, 1713, 1715 and 1718). (Photograph's: author's own, courtesy of Z. Kafafi and G. Rollefson of the 'Ain Ghazal Project).

Figure 9.9: Cones (CO#s 1717-left, and 1709-right). Both are damaged, yet display a similar shape and size. (Photograph's: author's own, courtesy of Z. Kafafi and G. Rollefson of the 'Ain Ghazal Project).

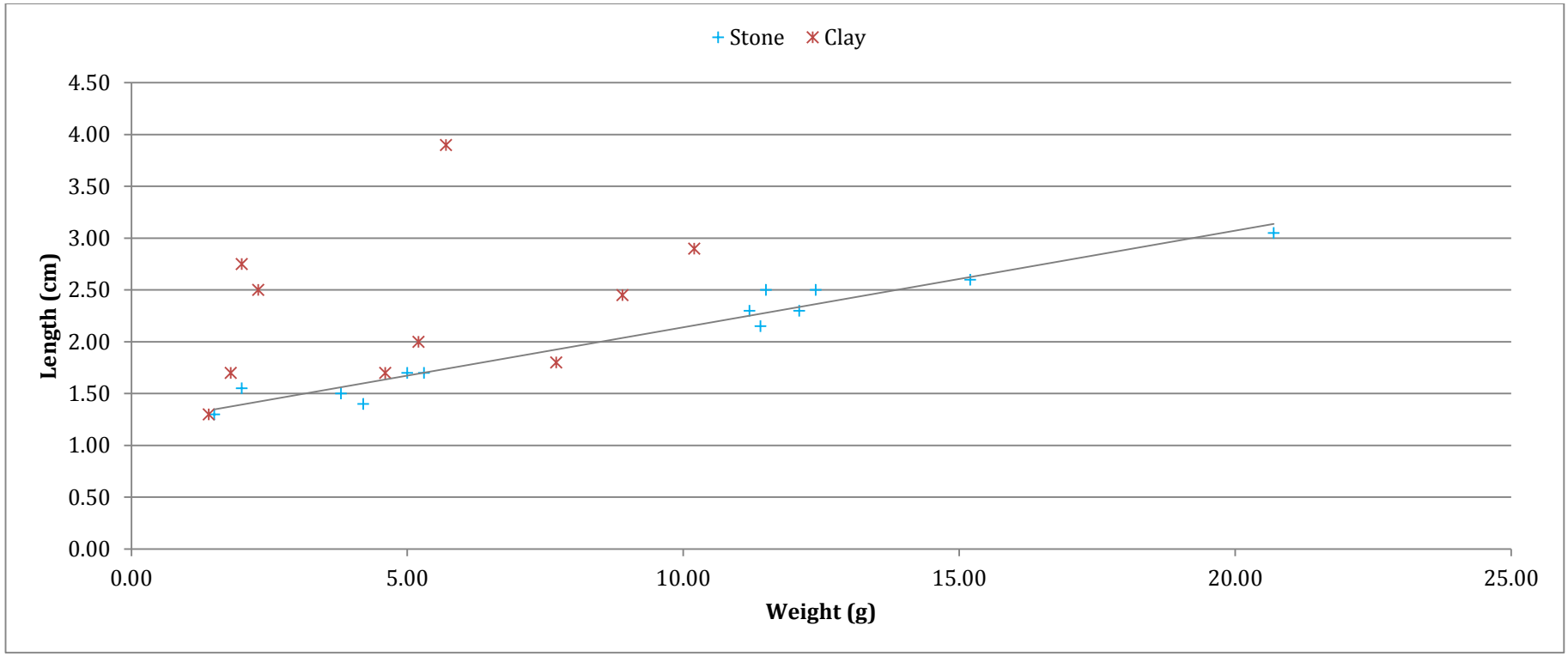


Figure 9.10: Weight and size of the 26 viewed (tier 1) objects at 'Ain Ghazal, according to raw material (stone and clay).

Figure 9.11: Incised objects at 'Ain Ghazal. Above: Incised limestone cone (CO#1700). Below: Incised pebble (CO#1711). (Photograph's: author's own, courtesy of Z. Kafafi and G. Rollefson of the 'Ain Ghazal Project).

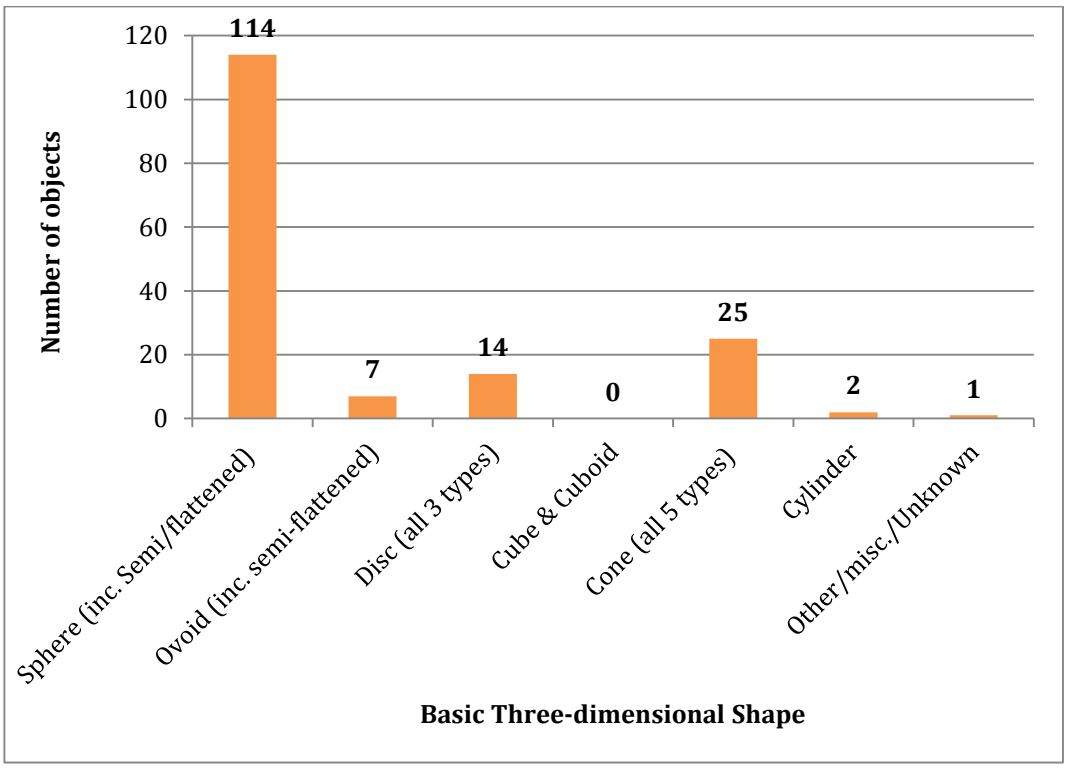


Figure 9.12: Range of basic shapes represented by the total studied 'Ain Ghazal assemblage (published and viewed n=163). (Includes data from Iceland 2010a & 2010b).

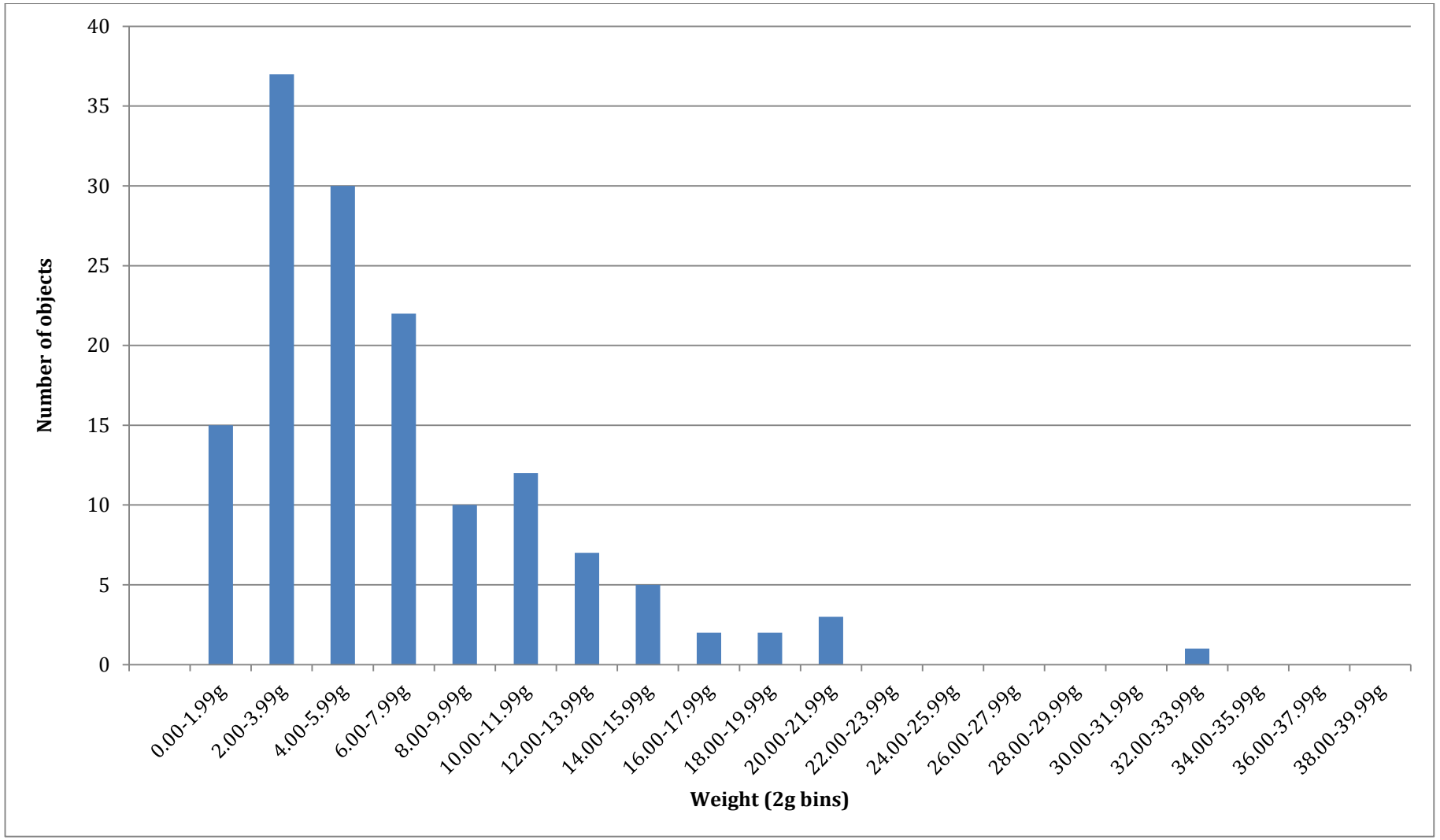


Figure 9.13: Weight of 'Ain Ghazal objects in 2g bins. Data includes published and viewed objects from the site (Note: weight is not available for all studied objects). (Includes data from Iceland 2010a & 2010b).

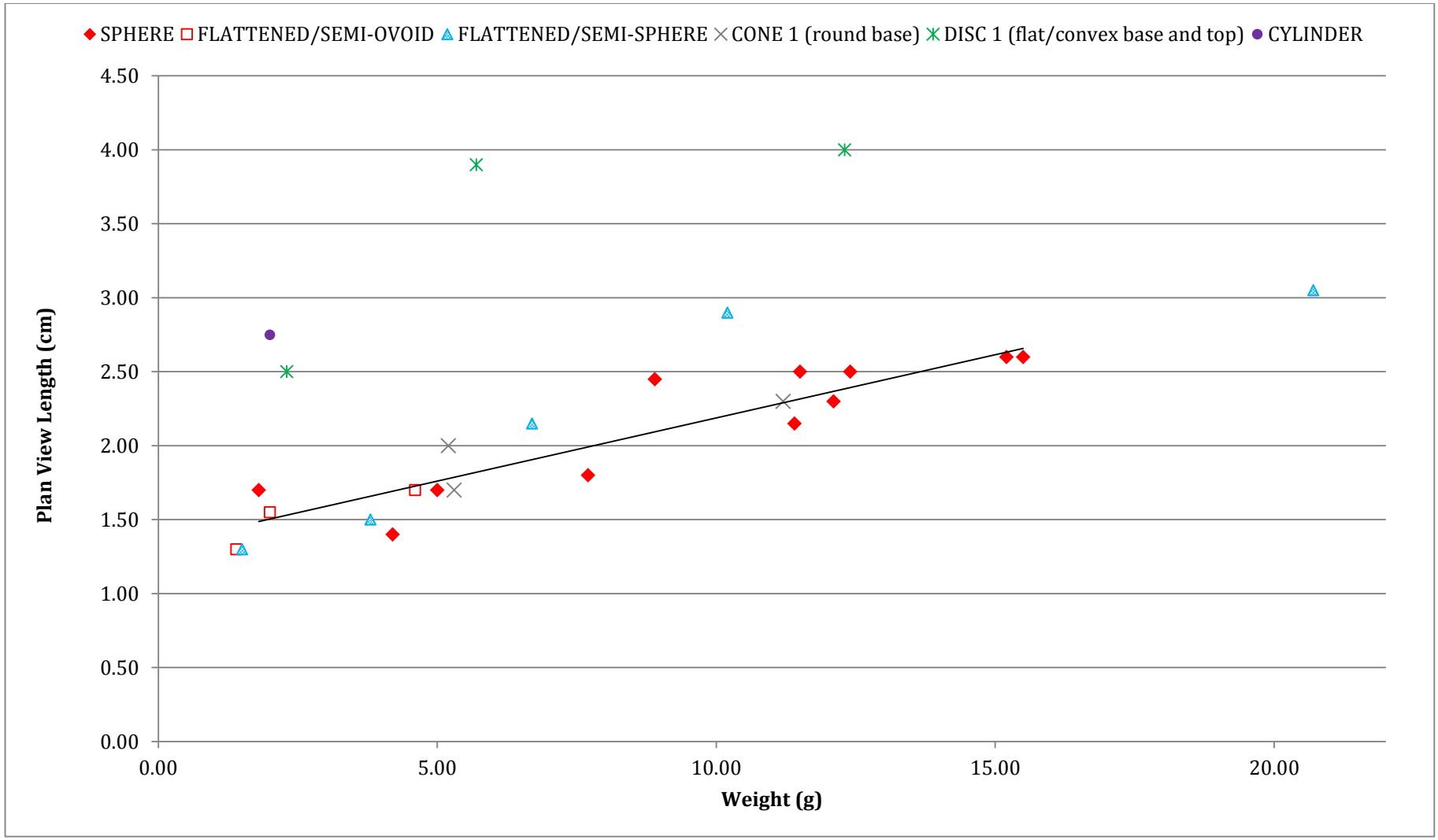


Figure 9.14: Comparison of the weight and maximum length of the 26 viewed (tier 1) 'Ain Ghazal objects by three-dimensional shape.

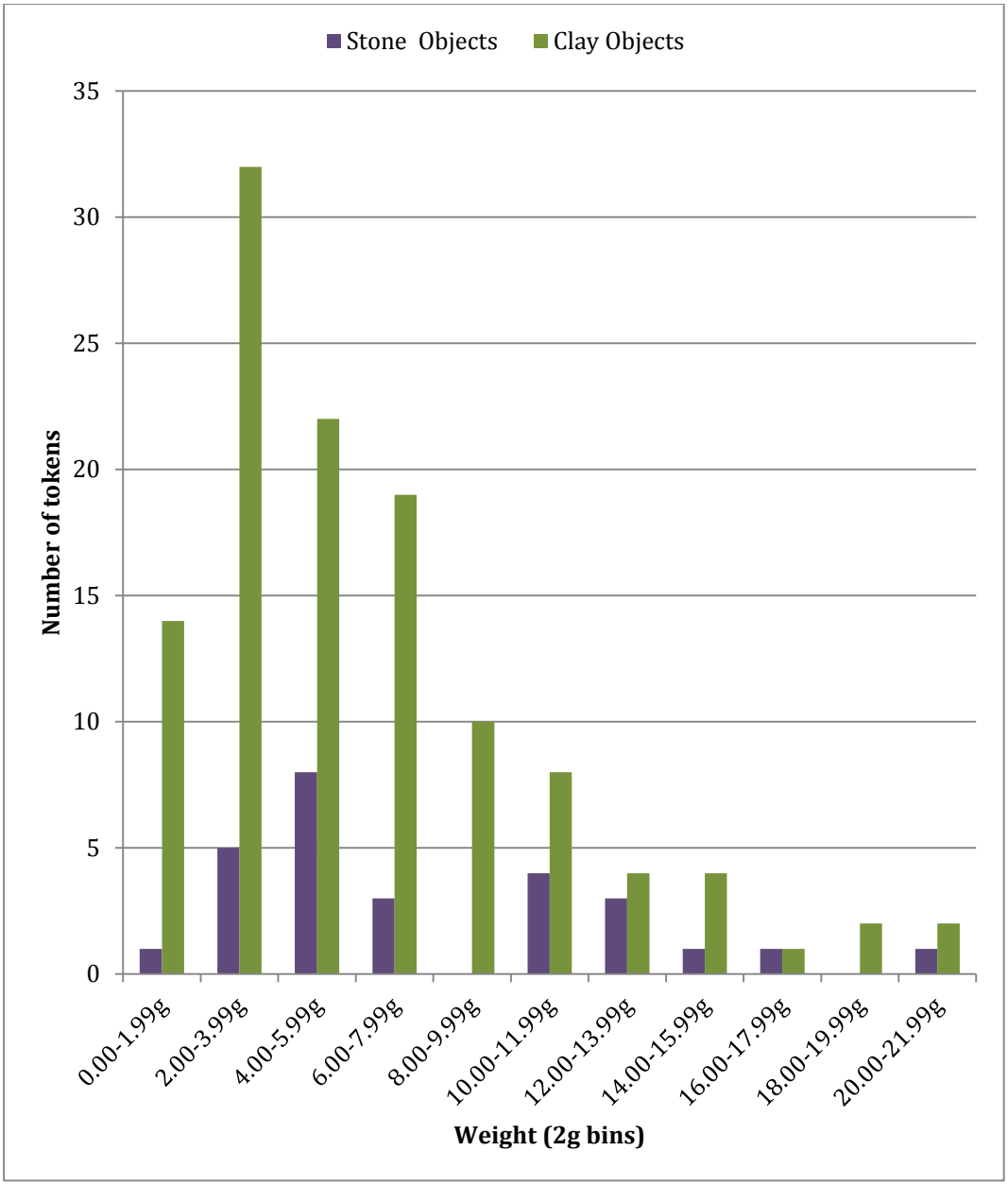


Figure 9.15: Weight of all 'Ain Ghazal objects in 2g bins by raw material. (Includes data from Iceland 2010a & 2010b).

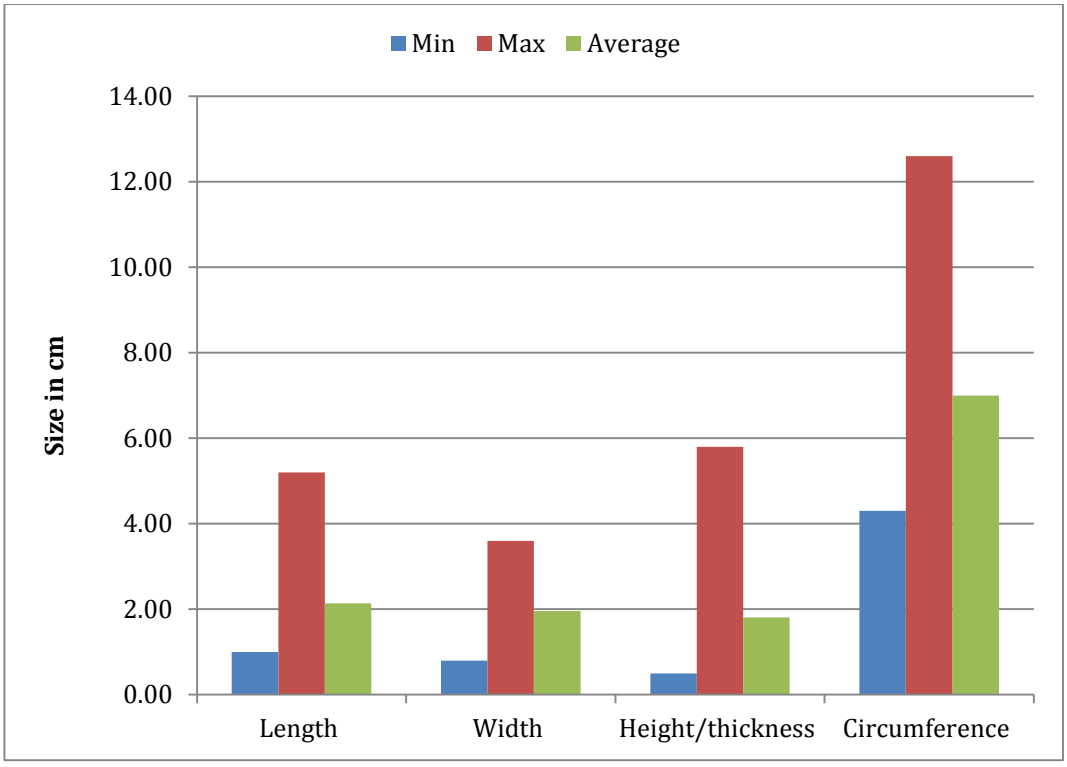


Figure 9.16: 'Ain Ghazal clay objects only: minimum, maximum and average clay object size (as recorded in length, width, height/thickness and circumference) for all studied objects (not all objects have a recorded size for all angles). (Includes data from Iceland 2010a & 2010b).

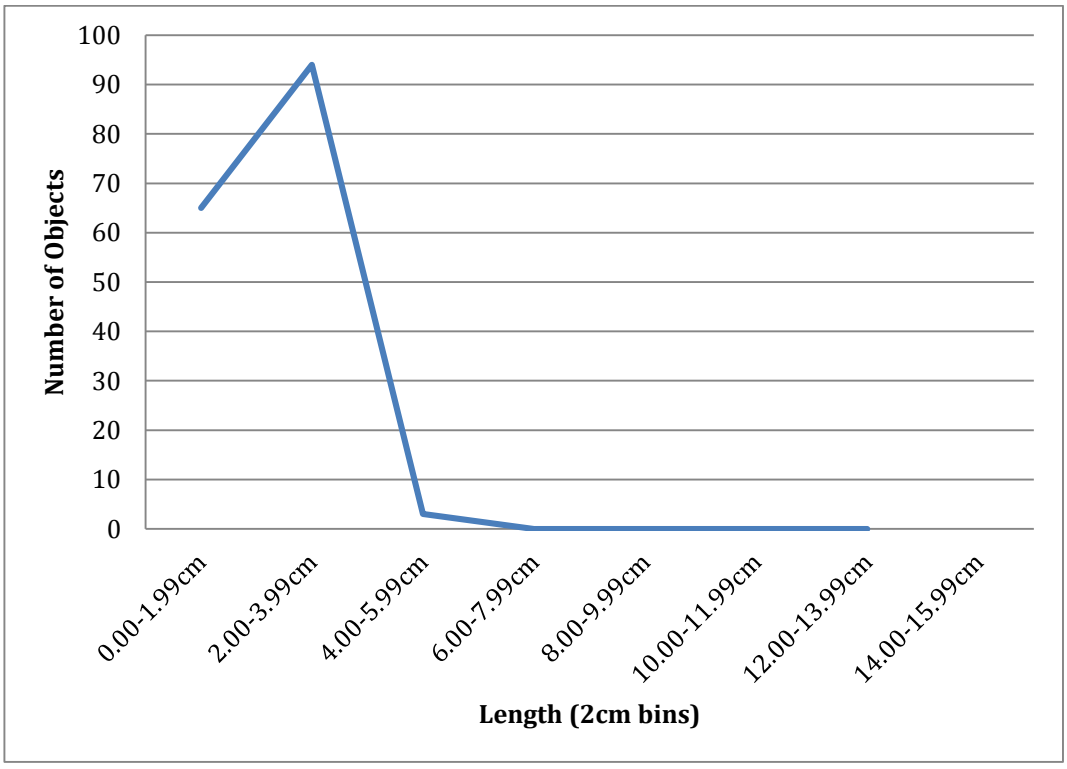


Figure 9.17: Length of all studied objects from 'Ain Ghazal in 2cm bins (162 of the 163 studied objects have a length measurement recorded). (Includes data from Iceland 2010a & 2010b).

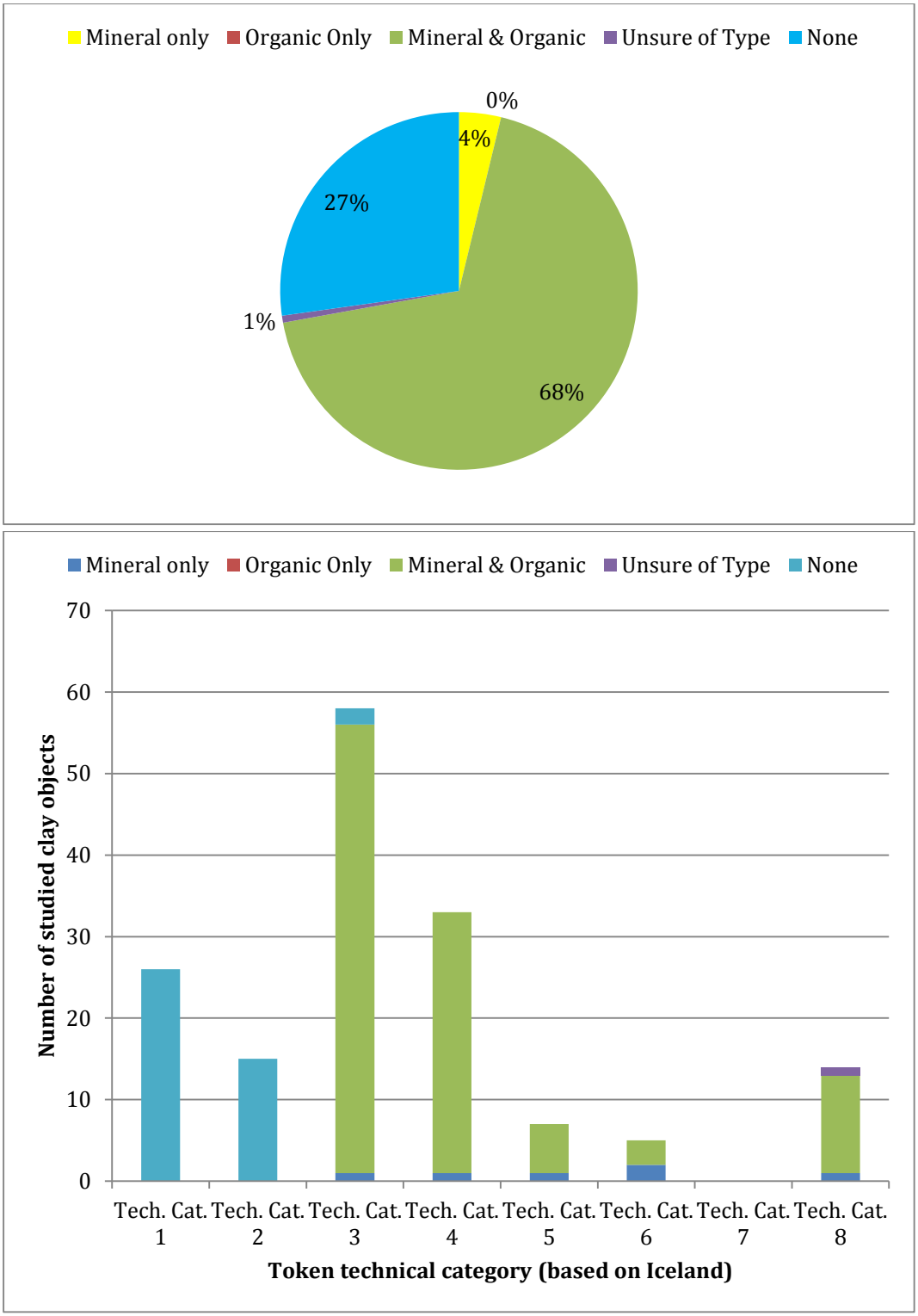


Figure 9.18: (Top) number of clay objects from 'Ain Ghazal objects containing inclusions of each of the broad types: mineral, organic, both or none**. (Bottom)** number of objects assigned to each of Iceland's published technical categories (see table 10.6 below for category descriptions), divided by the presence and basic type of inclusions seen in the clay. (Includes Data from Iceland 2010a & 2010b).

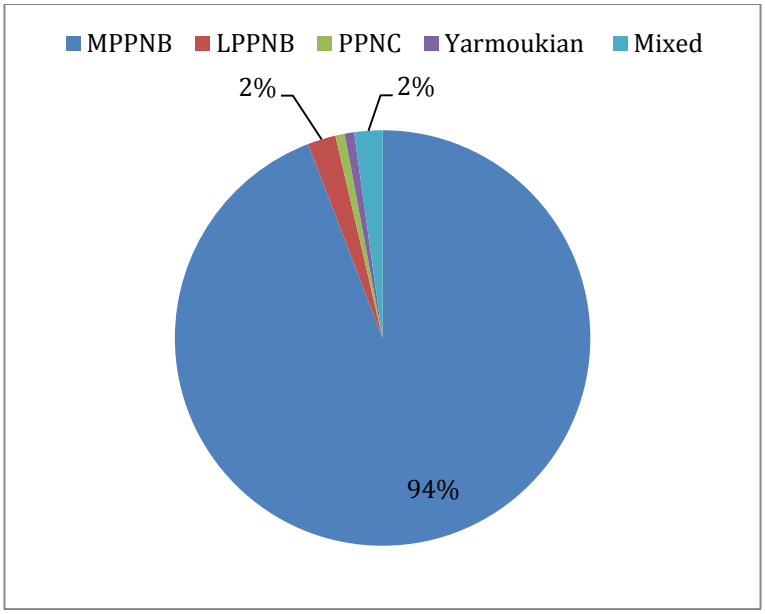


Figure 9.19: Number of clay objects by broad Neolithic phase (published objects only, n=137, the n=viewed objects have no data regarding excavation level aside from being Neolithic). (Data from Iceland 2010a).

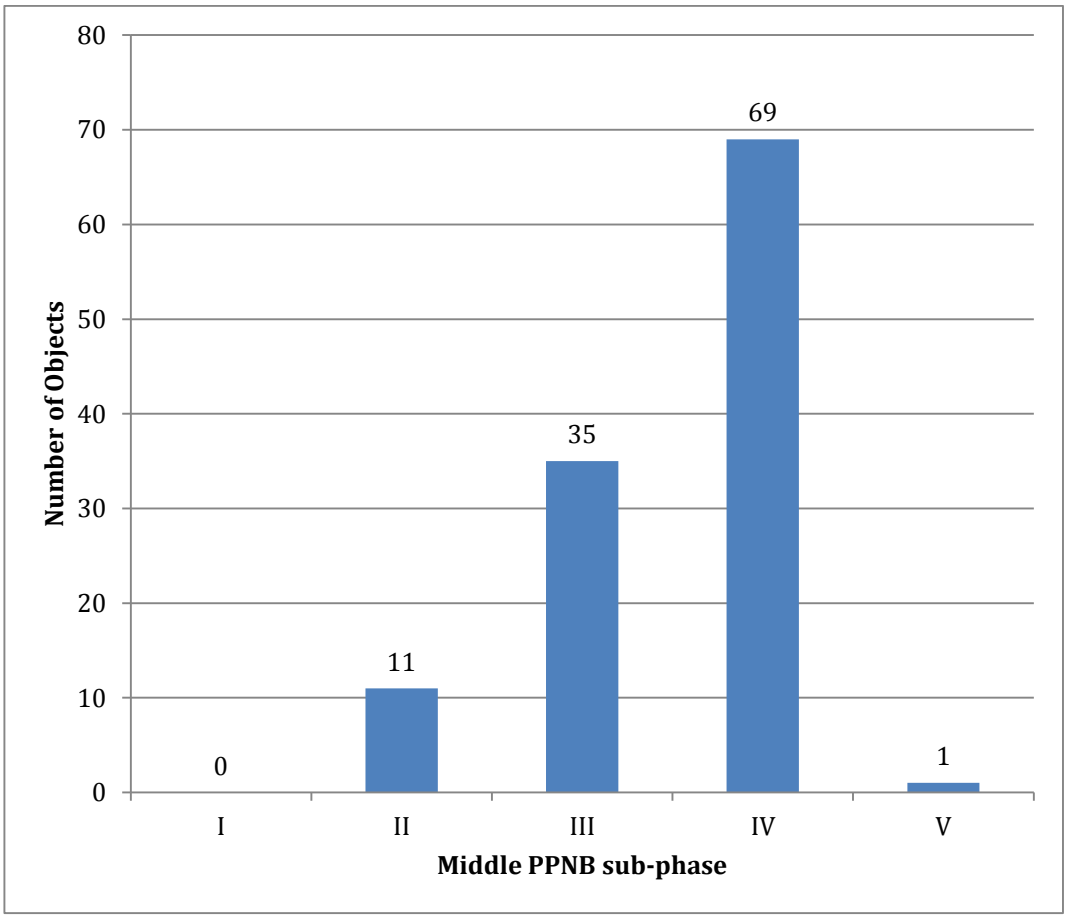


Figure 9.20: Number of objects by 100 year-long sub-phase of the MPPNB occupation at 'Ain Ghazal, c. c. 7,200-6,500 BC uncalibrated. (Data from Iceland 2010a).

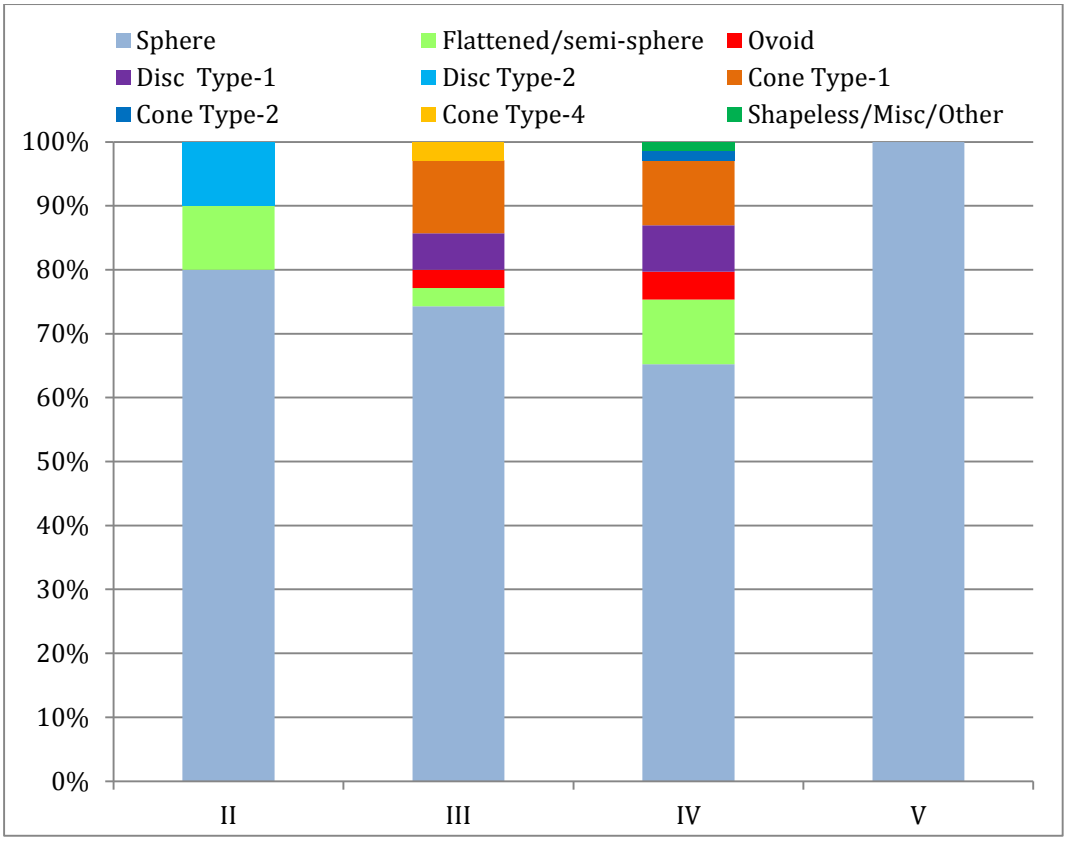


Figure 9.21: Proportion of objects by three-dimensional shape with each of the 5 MPPNB sub-phases at 'Ain Ghazal (c. 7,200-6,500 BC uncalibrated). (Data from Iceland 2010a & 2010b).

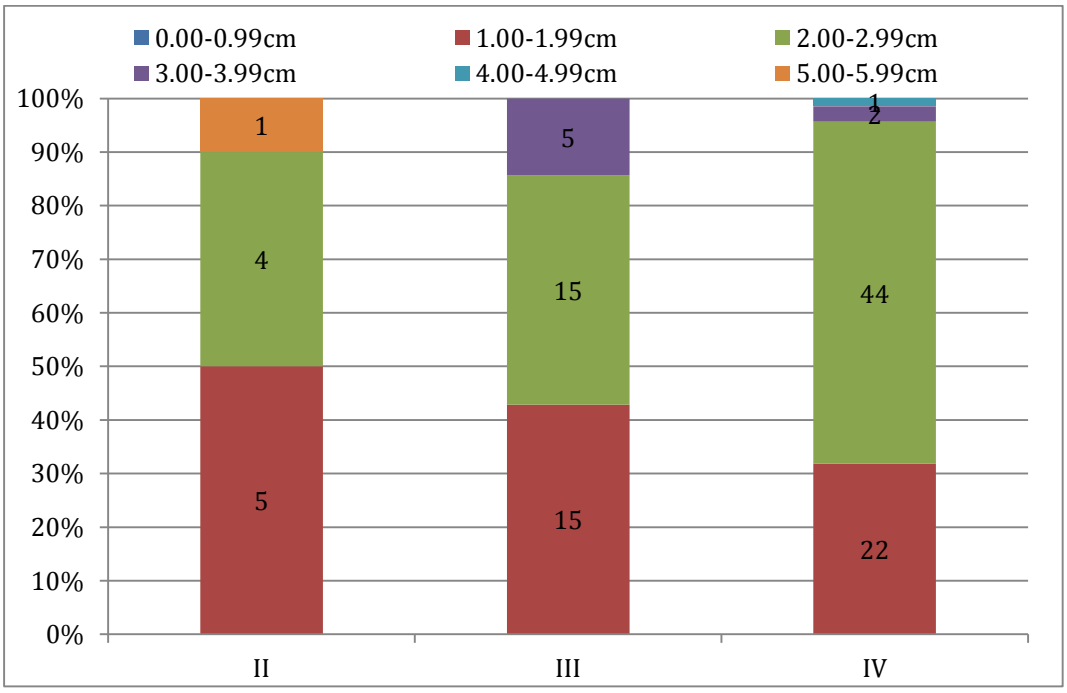


Figure 9.22: Object size (length in 1cm bins) as a proportion of each MPPNB sub-phases' total at 'Ain Ghazal, c. 7,200-6,500 BC uncalibrated. (Data from Iceland 2010a).

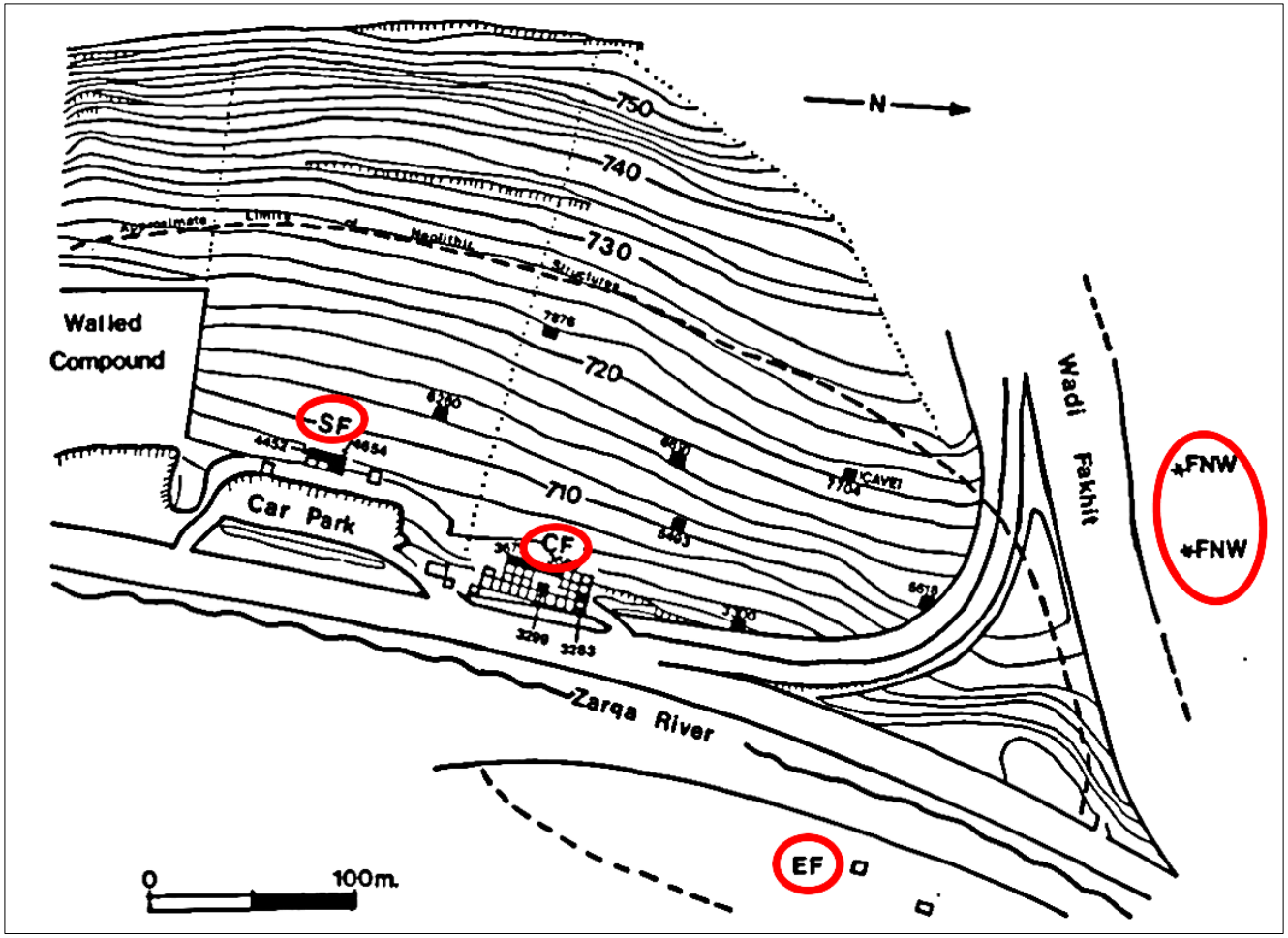


Figure 9.23: Plan of Neolithic 'Ain Ghazal, located to the northwest of Amman, Jordan. The main excavation areas are marked: CF (Central Field), NF (North Field), SF (South Field) and FNW (Far Northwest Extension). (Adapted from Rollefson, Simmons *et al.* 1992: fig. 2 p. 446).

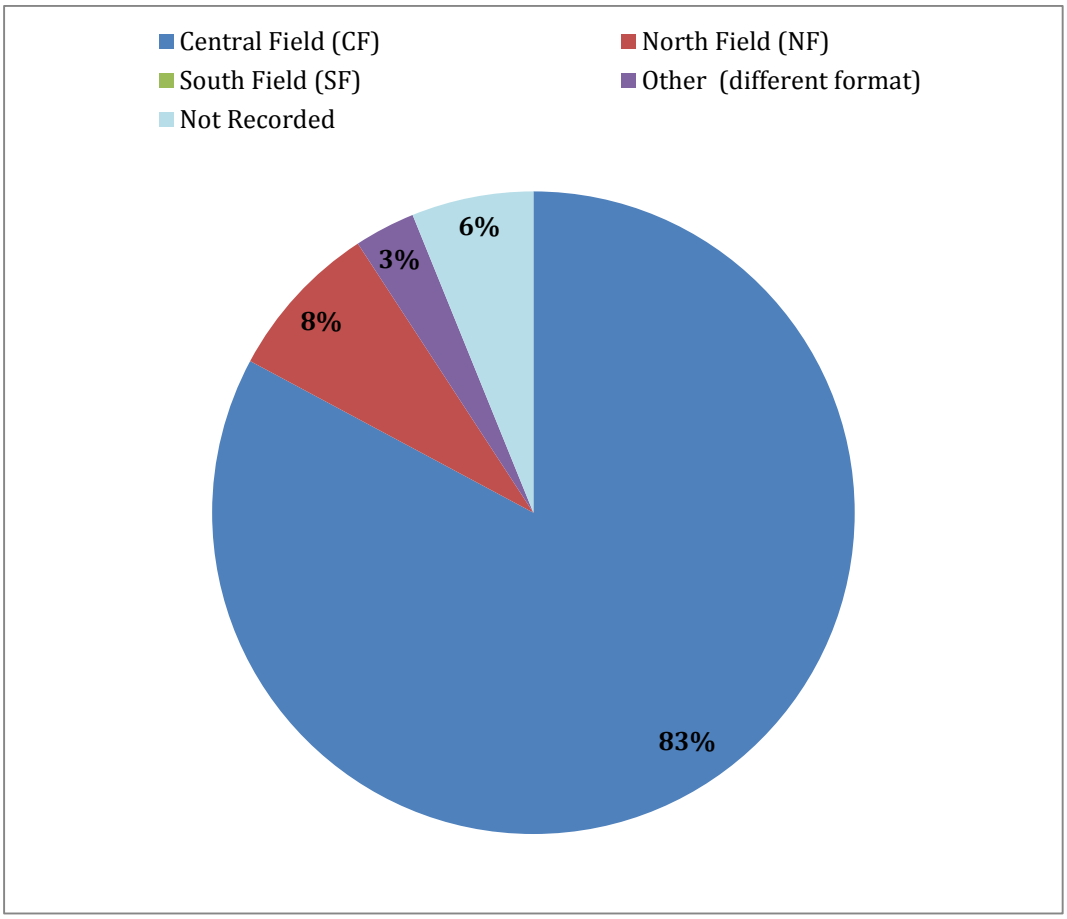


Figure 9.24: Clay object distribution by area of site at 'Ain Ghazal. Includes objects studied both in person (n=26) and from publications (n=137). (Based on data from Iceland 2010a & 2010b).

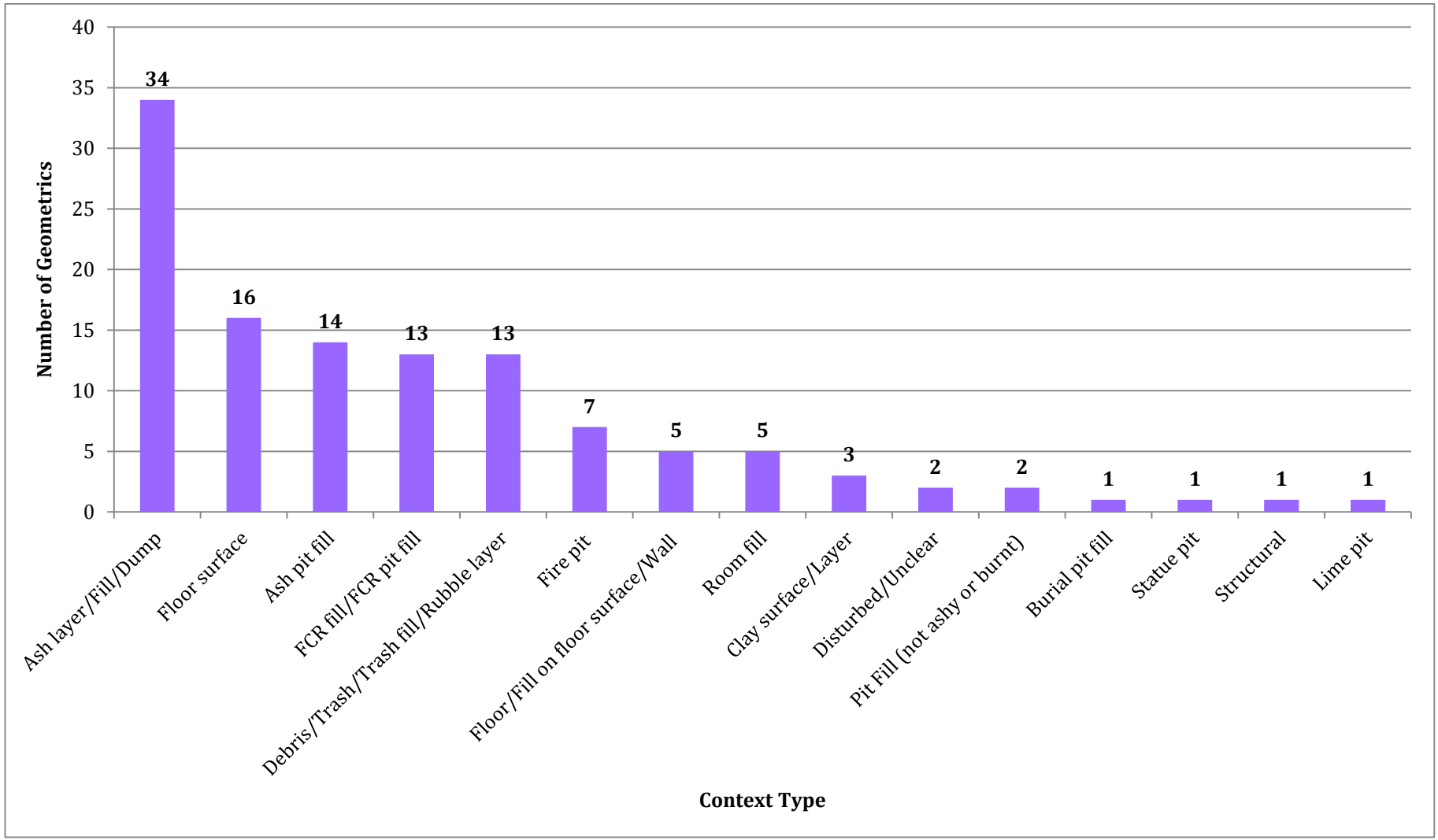


Figure 9.25: Distribution of clay objects by context type at ‘Ain Ghazal (from a total of 118 clay objects with a context description). (Data from Iceland 2010a).

Figure 9.26: Clay objects from 6th millennium cal. BC Tell Arpachiyah (upper Mesopotamia: (CO#s 881-887). (Photograph: author's own, courtesy of the Trustees of the British Museum, London).

Figure 9.27: Small, pierced geometric objects from 6th millennium cal. BC Tell Arpachiyah (upper Mesopotamia). CO#s 893 and 894. (Photograph: author's own, courtesy of the Trustees of the British Museum, London).

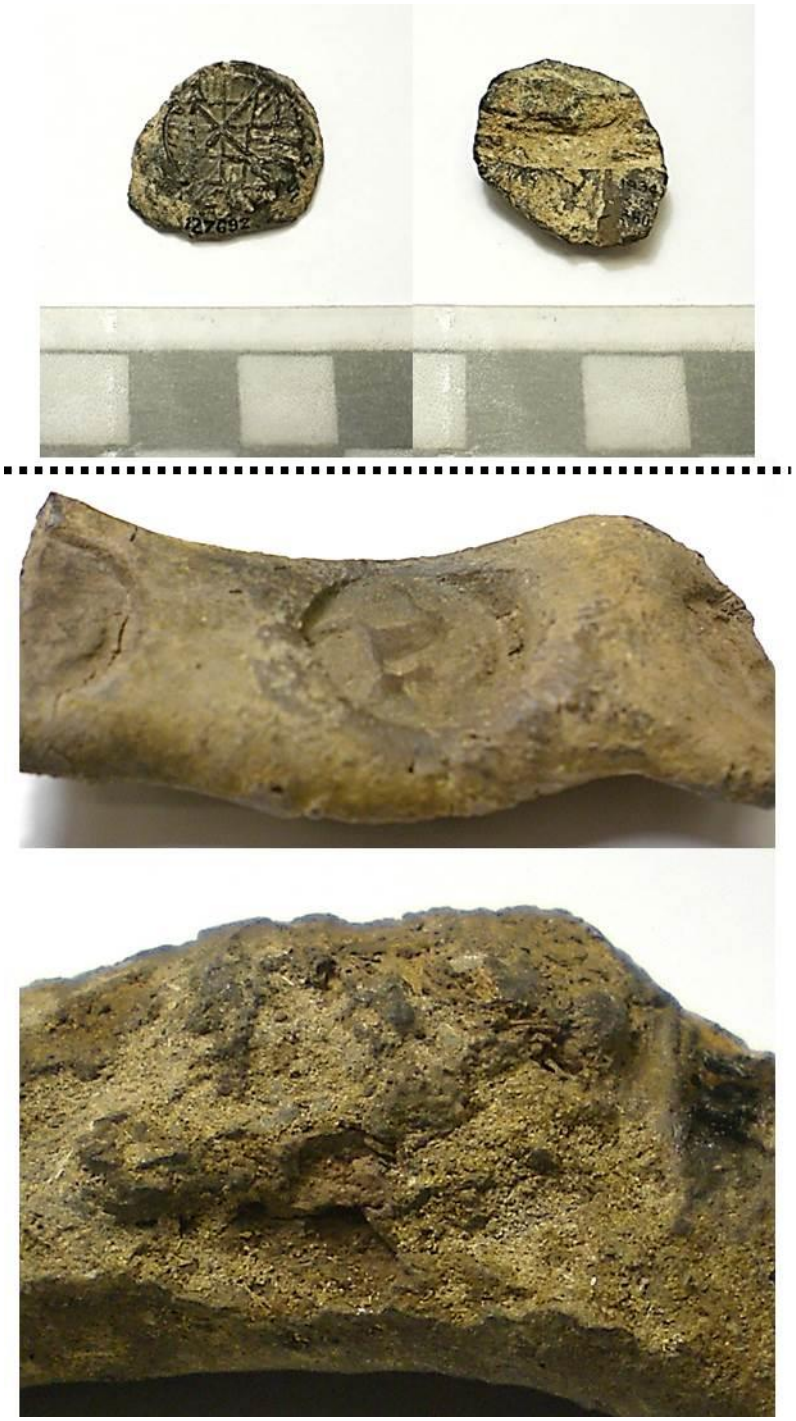


Figure 9.28: Two small clay items; likely sealings recorded from 6th millennium cal. BC Tell Arpachiyah (upper Mesopotamia). **(Top)** CO# 898-front (bearing stamp seal impression) and reverse (string impressions). **(Bottom)** elongated CO# 890 with multiple stamp seal impressions on the front and impressions of what the object was attached to on the reverse. CO# 890 dimensions: 7.70cm x 3.40 cm x 2.50cm. Photographs: author's own, courtesy of the Trustees of the British Museum, London).

Figure 9.29: Conical shaped clay object, with impressions.-example of a solid bulla? From 6th millennium cal. BC Tell Arpachiyah. CO# 888. Dimensions: 5.70 cm x 2.90 cm x 2.70 cm. (Photographs: author's own, courtesy of the Trustees of the British Museum, London).

Figure 9.30: Sealings from 6th millennium cal. BC tell Halaf (upper Mesopotamia). Both examples, though fragmentary, display bear stamp seal impression on the smooth, outer, convex and otherwise polished surface while the reverse surface is rough and unfinished looking where the object appears to have been placed onto a rough surface while wet, in the form of a container or package of some kind. **(a)** CO# 901. **(b)** CO# 902. (Photographs: author's own, courtesy of the Trustees of the British Museum, London).

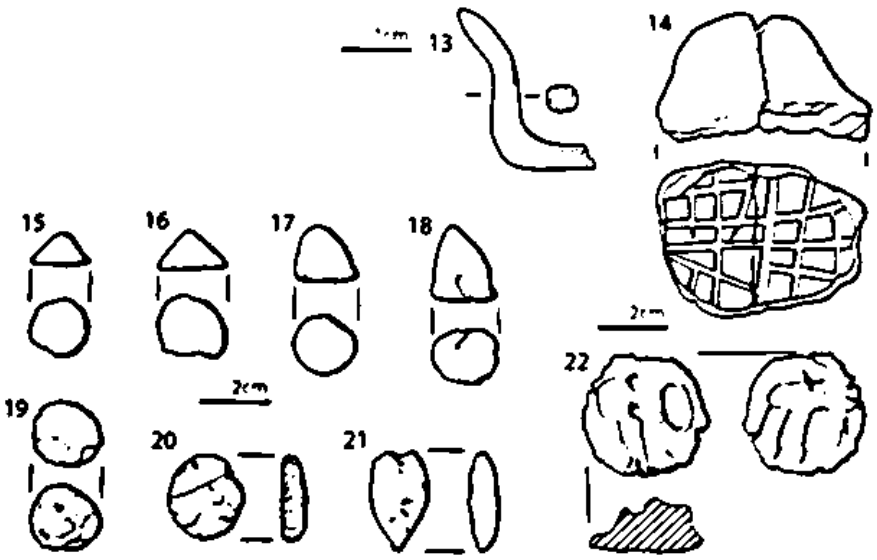


Figure 9.31: Example of sealings (nos. 13 and 14, total of n=5 reportedly recovered from the site) and clay objects (nos. 15-22, total n=24) from 6th millennium cal. BC (Halaf) Tell Kurdu, southeastern Anatolia (modern Hatay province). (Adapted from Özbal, R. *et al.* 2004: fig. 13 p. 104).

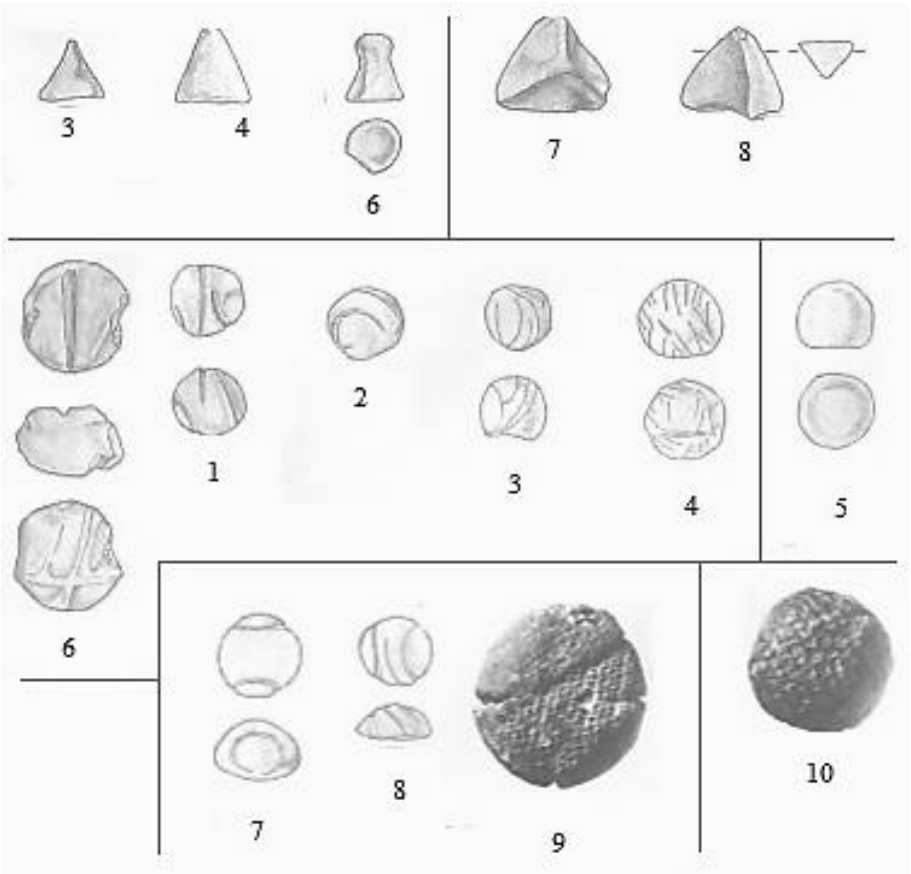
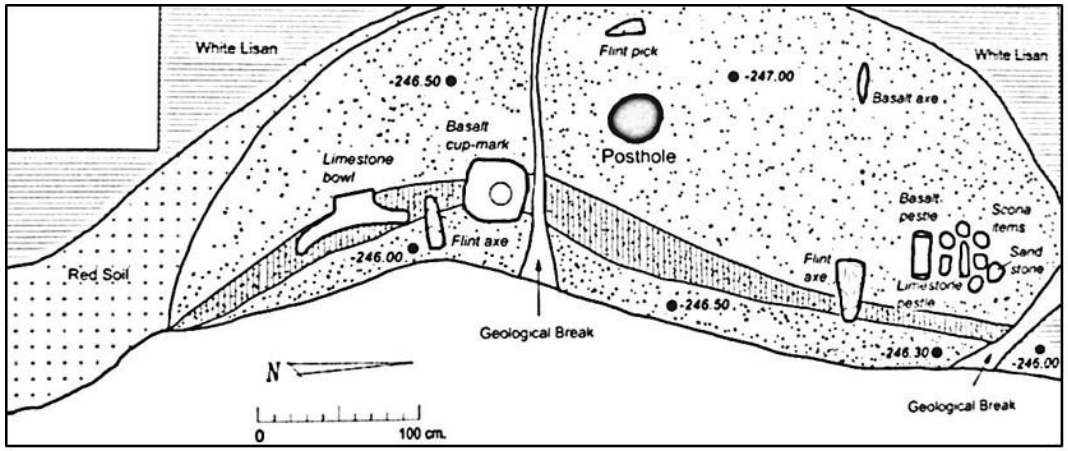
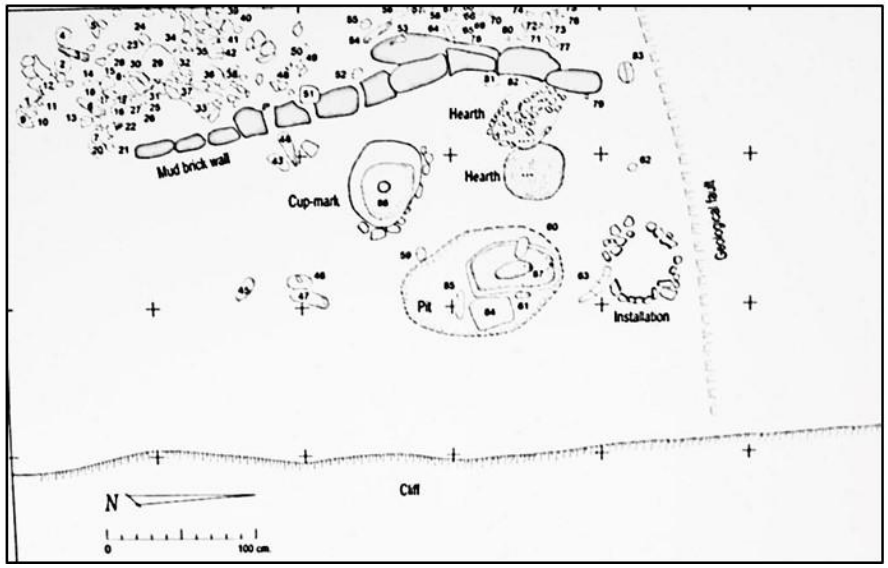


Figure10.32: Range of clay objects recorded from Late Ceramic Neolithic Jarmo in the Zagros Mountains region. (Broman Morales 1983: cones fig. 168 p. 325. Others fig. 169 p. 326). See *Clay Object Database* for further details (Appendix A).





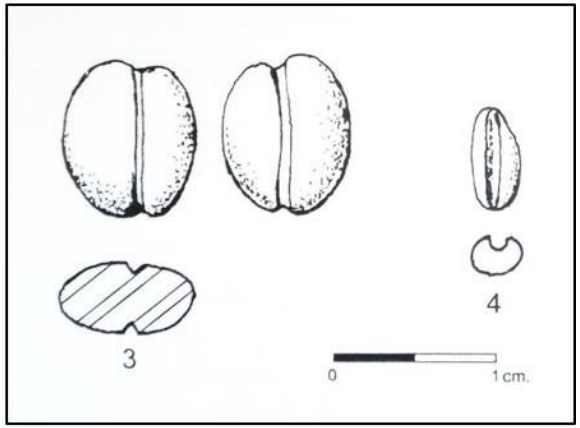


Figure 9.33: Left: Plan of excavation Areas A **(top left)** and B **(bottom left)** at the small PPNA site of Gesher, Central Jordan Valley. **(Top)** three incised clay objects from Gesher. Photograph: CO# 1690-reddish limestone. Drawing: CO# 1690 (no. *5*), CO#1691 (*3*) and CO# 1692 (*4*). See the *Clay Object Database* (Appendix A) for full object details. (Adapted from Garfinkel, Dag 2006: fig. 3.1b-p. 39, fig. 3.14a-p.48. Pl. XIIa & fig.6.1p.154).

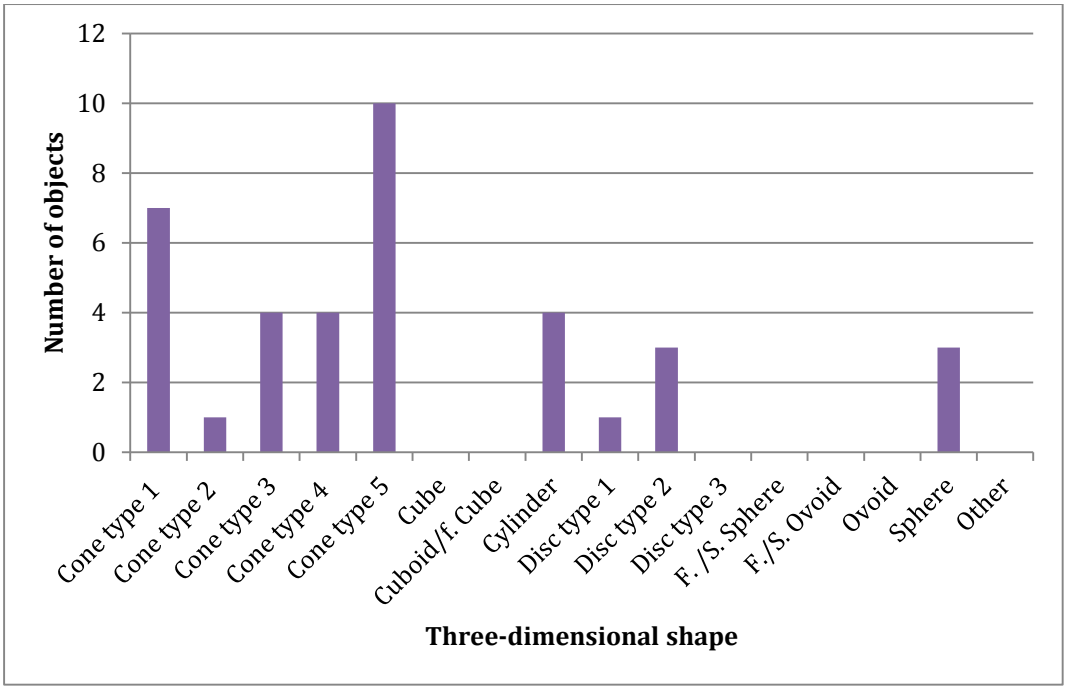


Figure 9.34: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) of the 37 objects recorded at tier 2 Sarab. Note only a fraction of the 2,400 clay objects recovered were published (n=441) and even fewer illustrated (n=49) enabling recording on the *Clay Object Database.* See Also Appendix H table A-H.8 and individual object entries (Appendix A) under the site name for reference information.

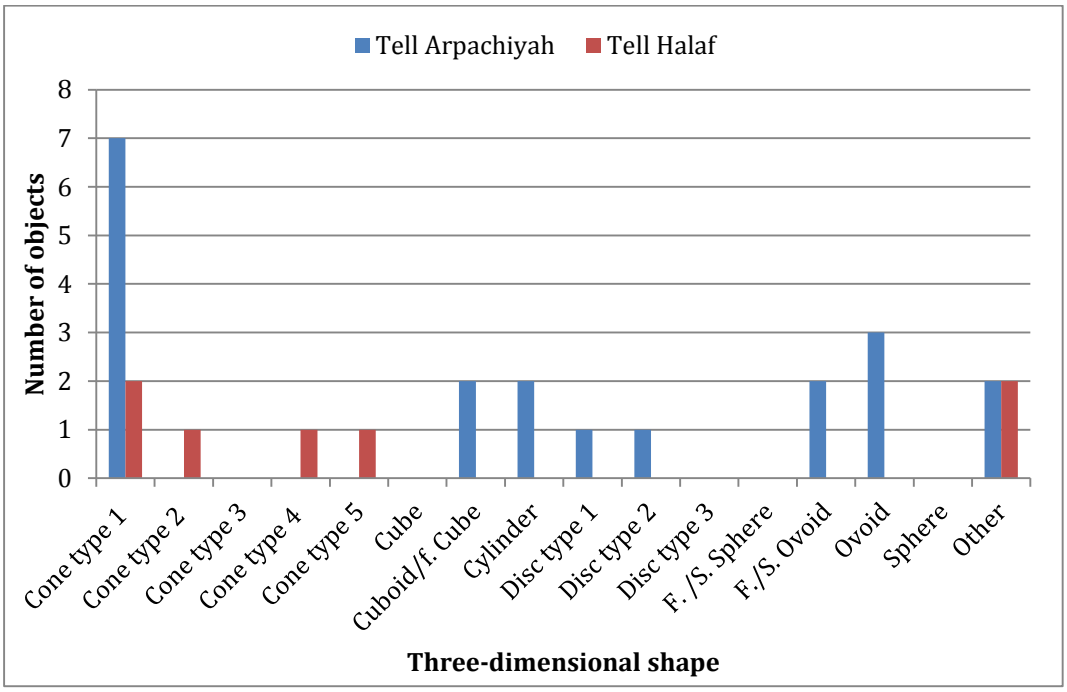


Figure10.35: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) of objects recorded at tier 2 Tell Halaf and Tell Arpachiyah. See individual entries in Appendix A (*Clay Object Database*) for references.

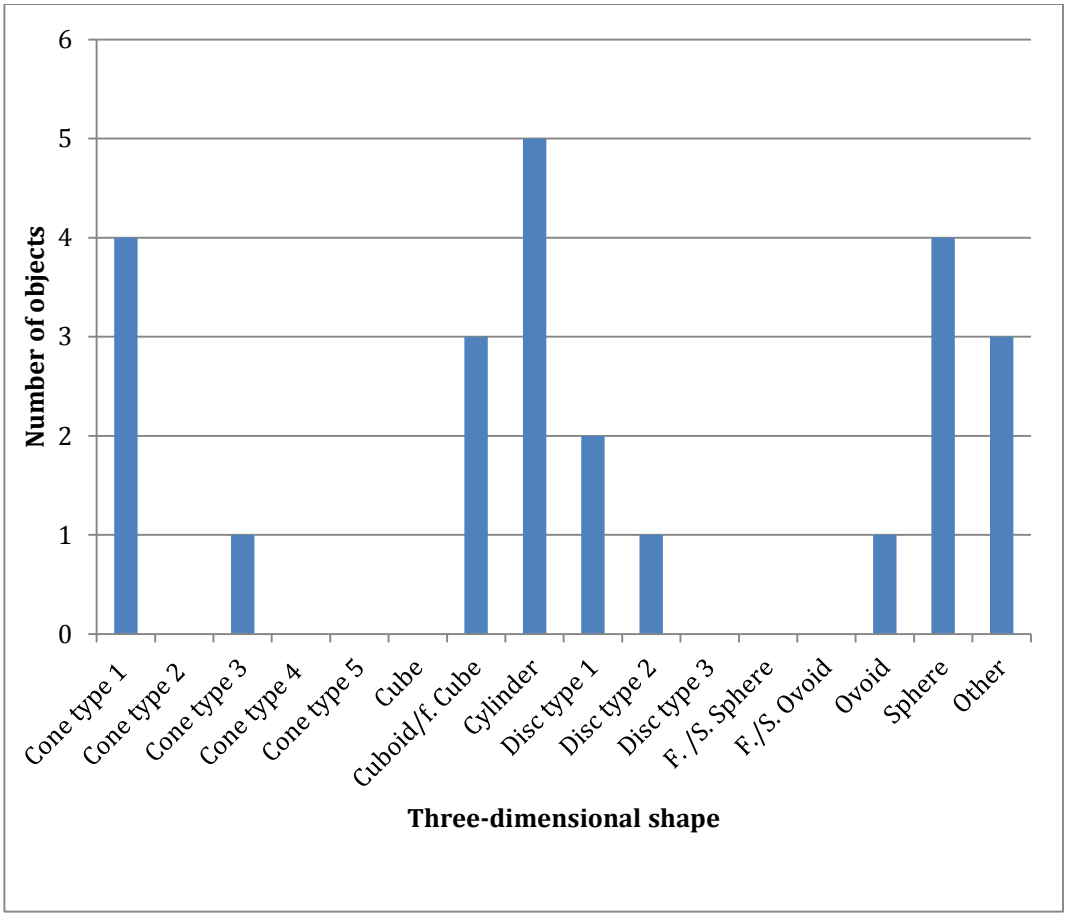


Figure 9.36: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) of objects recorded at tier 2 Jericho. See individual object entries (Appendix A) under the site name for reference information.

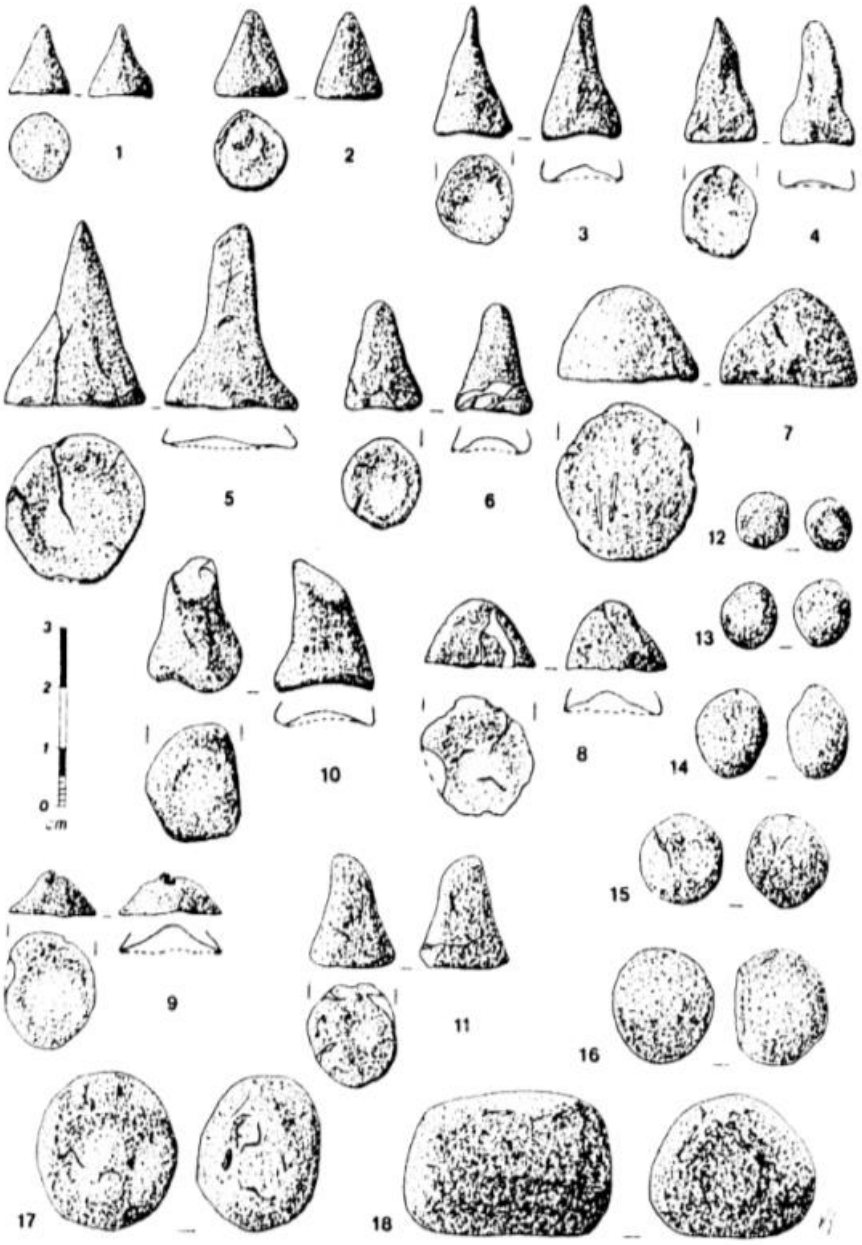


Figure 9.37: Range of shapes found in the token assemblage at Late PPNB Es-Sifiya, Wadi Mujib. (Mahasneh & Gebel 1998: fig. 1 p. 108).

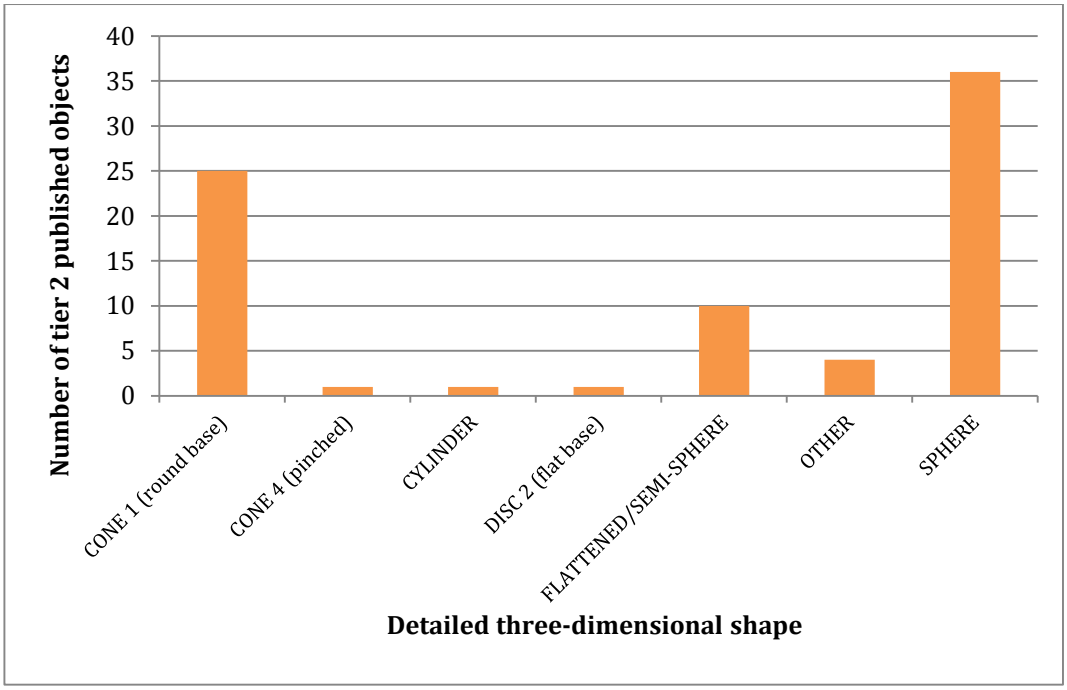


Figure 9.38: Range of three-dimensional shapes represented by the objects from Late PPNB Es-Sifiya, Wadi Mujib. (Data from Mahasneh & Gebel 1998: 108, fig. 1 p. 108).

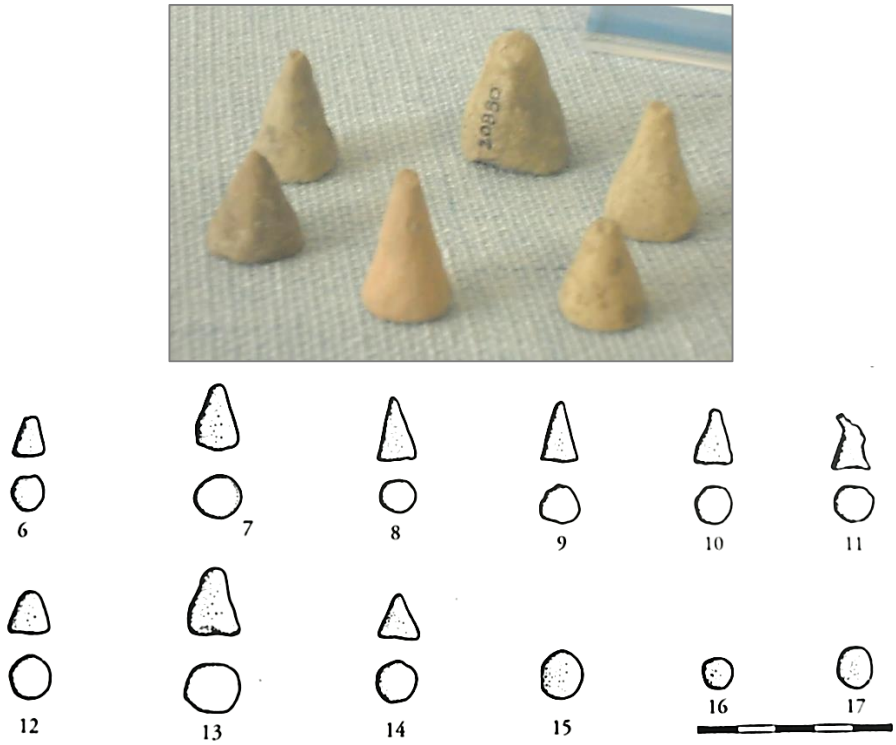


Figure 9.39: Shape uniformity- round base cones from Late Neolithic Ulucak Höyük, Western Anatolia. **(Photograph)** 6 of the 8 reported "cones" on display at the Izmir Museum. **(Drawing)** selection of published "cones" (see Ulucak Höyük entries on the *Clay Object Database* for full details). (Çilingiroğlu, Derin *et al.* 2004: fig. 31 p. 125. Photograph: author's own).

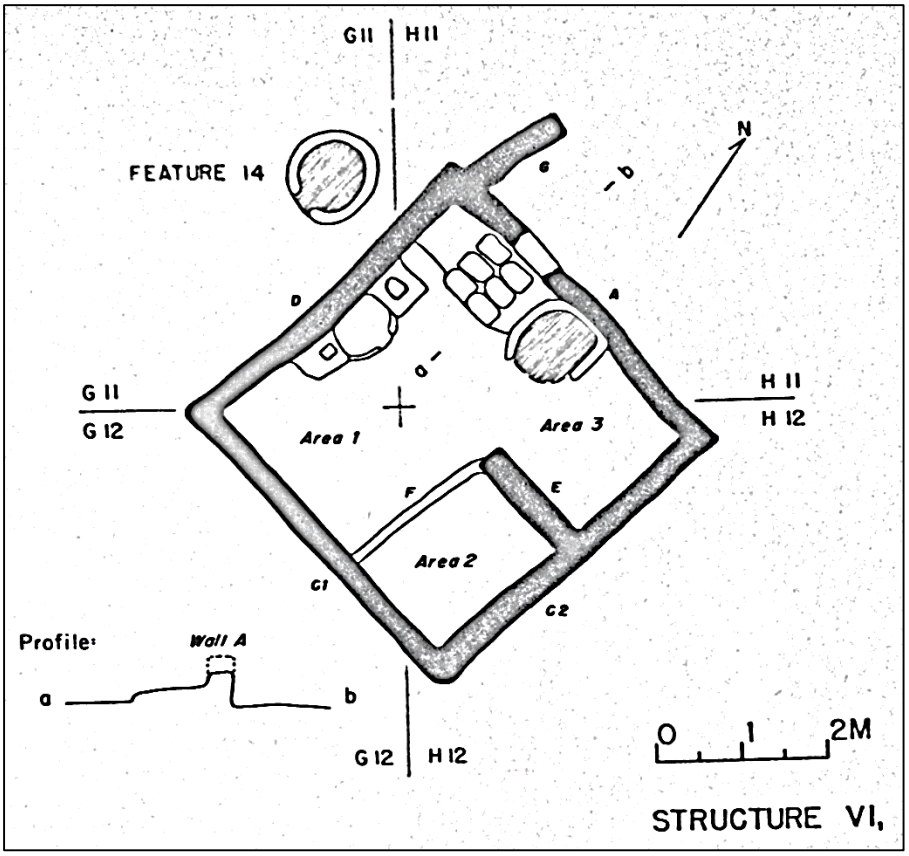


Figure 9.40: Structure VI, phase D at Hajji Firuz Tepe (6th millennium cal. BC site in the Zagros region); from which many of the site's clay objects were recovered. (Voigt 1983: fig 36 p. 47). See table 9.16(a) below for description of phase D.

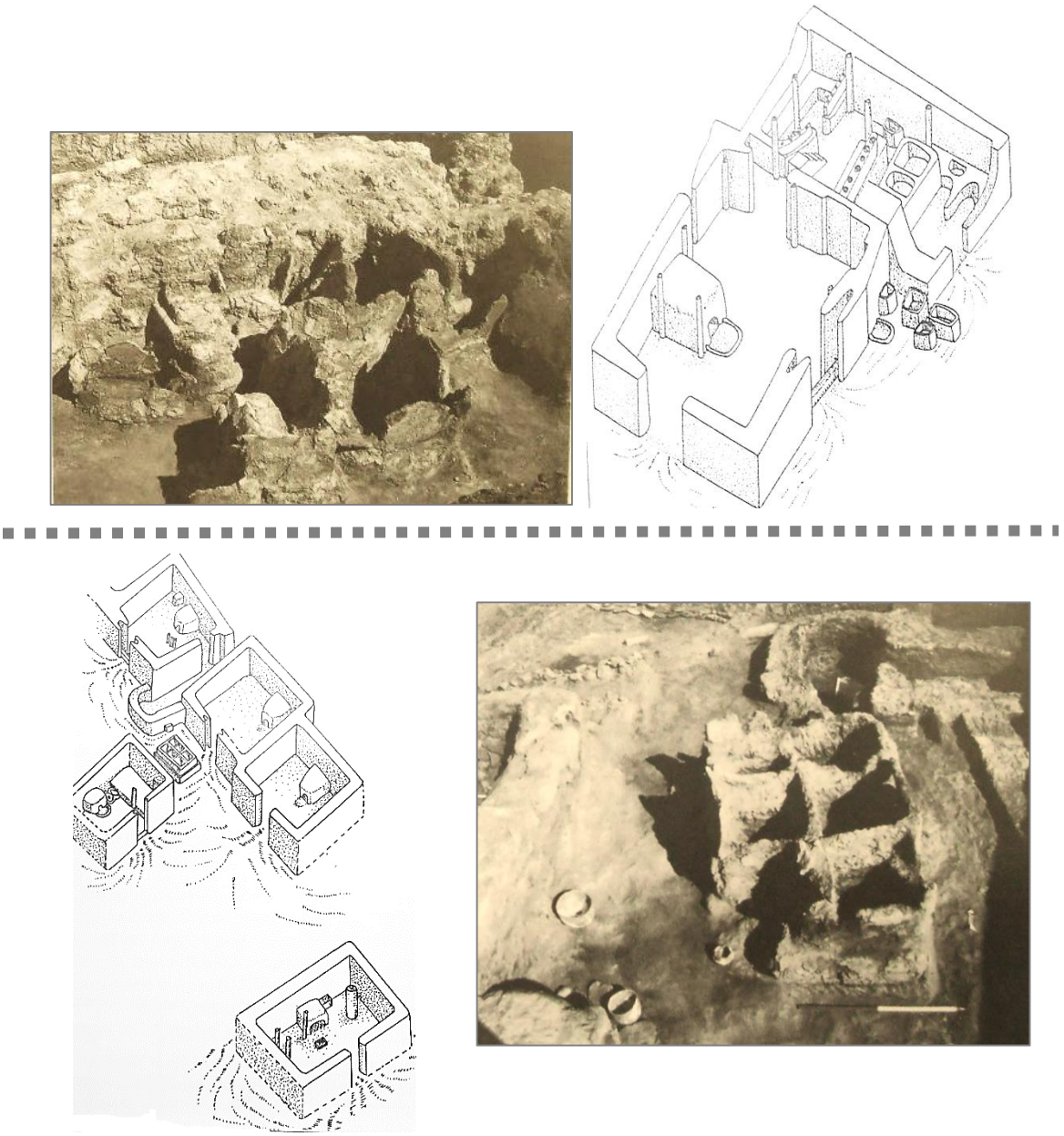


Figure 9.41: Example of a multi-celled storage silos at **(top)** Höyücek (Early Neolithic levels: Shine Phase c. 6,500-6,000 cal. BC), shown here recovered in both internal and external areas of the site. Similar silos were also recovered from Suberde, Hacilar and **(bottom)** Bademağacı (Building Level EN II 3, located in an open area, between buildings)-all in central Anatolia (Umurtak: (a) fig. 2a/b p. 12. (b) fig. 5a/b p. 13). Also see figure 3.5 Chapter 3.

TABLES:

SITE	NUMBER OF TIER 2 OBJECTS	CO#s	REGION	DATE/PHASE OF NEOLITHIC OCCUPATION	DATE/PHASE OF CLAY OBJECTS	CLAY OBJECT CONTEXT
'Ain Ghazal	163	1,693-1,855	Southern Levant	c. 7,250-5000 cal. BC -4 unbroken phases: MPPNB, LPPNB, PPNC, Yarmukian (Pottery Neolithic)	7,250-6,500 cal. BC -Middle PPNB (132 of the 137 published "tokens") (Almost all from the Middle PPNB; 70.55%) -See 'Ain Ghazal section of this chapter for more details-	-Distributed across all three main excavation areas -Exact nature of context not published
Aşıklı Höyük	5	1,992-1,998	Central Anatolia	8,450-7,450 BC -PPNB	No information	No information
Can Hasan I	2	1,557-1,558	Central Anatolia	Pre 6,000 cal. BC	No information	No information
Çayönü	38	1,993-2,680	Southeastern Anatolia	9,750-6,000 cal. BC - PPNA' PPNB' PPNC' Ceramic Neolithic	Approx. 7,600-7,200 BC -Cell Phase -The 33 limestone "pawn-shaped" pieces only	-n=33 identical objects found together (in 1968) in a cache a large house in the east side of the Cell Phase settlement.
Demirköy	4	1,575-1,578	Southeastern Anatolia	9,750-9,250 BC -Early PPNA	No information	No information
'Es-Sifiya, Wadi Mujib	78	1,858-1,935	Southern Levant	7, 930 +/- 70 cal. BC -Early 7th millennium BC -Late PPNB (one single radio carbon date so far)	-Late PPNB	-All geometrics come from a single context: -A "workshop" (discovered 1997) in Area C, Sq. 11, Locus 9 -No geometrics are found anywhere else on site -Context includes complete and fired pieces, complete unfired pieces, miscellaneous fragments and fired lumps. Also figurines -Context represents objects stored for a transaction, or rejected pieces.

Gesher	3	1,690-1,692	Southern Levant	9,600-9,200 BC -PPNA	c. 9,300 cal. BC -PPNA -Very short occupation across two distinct5 areas: A and B: only one phase in each. Relationship unclear.	-CO# 1690 Area A (no further details) -CO#s 1691 & 1692 Area B (from separate excavation squares)
Hajji Firuz Tepe	28	1,960-1,987	Zagros-Gadar Valley	5,700 BC- 4,900 BC (uncalibrated) -Late Neolithic	c. 5,812 cal. BC - Phase D	*Most* from floor of rectangular Structure IV
Hakemi Use	5	1,579-1,583	Southeastern Anatolia	c. 6,500 to 6,000/5,800 BC -Hassuna/Samarra (Ceramic Neolithic)	No information	N=33 identical objects found together (in 1968) in a cache. Context details not published.
Höyücek	25	1,574, 1,584-1,607	South central Anatolia	7,000-5,600 cal. BC -Pottery Neolithic (divided into Early and Late Neolithic and three cultural phases): **1 -**Early Settlements Phase-"Early Neolithic" c. 7,000-6,550 cal. BC **2**- Shrine Phase-"Early Neolithic" c. 6,500-6,000 cal. BC **3-** Sanctuaries Phase-"Late Neolithic" c. 5,900-5,700 cal. BC	5,900-5.700 cal. BC -Sanctuaries Phase-Late Neolithic	-First Sanctuary only (on floor of the building, underneath the platform/fallen walls of the building along with many other finds.
Jarmo	620	1,999-2,619	Zagros-Chemchemal Valley	Approx. 6,000 cal. BC / late 6th millennium cal. BC -Late Ceramic Neolithic	No information	No information
Jericho	24	1,936-1,959	Southern Levant	Approx. 10,000-5,400 cal. BC -PPNA, PPNB, Pottery Neolithic A, P Pottery Neolithic B	Various (most Neolithic phases except final Pottery Neolithic) -PPNA: n=6 -PPNB: n=10 -Pottery Neolithic A: n=6 -Unstratified/not published: n=2	No information
Salat Cami Yanı	15	1,559-1,573	Southeastern Anatolia	Approx. c. 6,500 to 6,200 cal. BC - Early Pottery Neolithic	No information	No information

Sarab	37	2,620-2,687	Zagros-Kermanshah Valley	late 6th / early 5th millennium cal. BC -End Ceramic Neolithic	No information	No information
Suberde	59	1,608-1,666	Central Anatolia	7,600-6,500 BC -Aceramic Neolithic	No information	No information
Tell Arpachiyah	20	879, 881-899	North Mesopotamia-Upper Tigris River	c. 5,800-5,000 cal. BC - Halaf /Late Neolithic	Burnt House c. 5,300 cal. BC -Late Halaf	-Some from the Burnt House TT6, along with over 150 other finds (including polychrome ceramics, stamp seals, sealings and figurines. Most have no information
Tell Halaf	7	876-878, 880, 900-902	North Mesopotamia-Khabur River	6,000-5,000 cal. BC -Halaf (ceramic Neolithic)	No information	No information
Tell Hemmeh	2	1,856-1,857	Southern Levant	c. 8,850 cal. BC -Multi-period PPNA and PPNB	No information	No information
Tell Kurdu	11	1,667-1,677	Southeastern Anatolia	6th millennium cal. BC -Halaf (ceramic Neolithic)	No information	No information
Ulucak Höyük	12	1,678-1,689	Western Anatolia	6,700/6,500 to 5,700/5,650 cal. BC -Aceramic and Ceramic Neolithic -Neolithic to Chalcolithic as represented by Phases IV, V & VI	c. 5,990-5,660 cal. BC -Phase IV, End of Late Neolithic	No information

Table 9.1: Summary of the twenty sites from which small geometric clay objects were studied, and recorded on the *Clay Object Database* (Appendix A), For references, see individual site entries in Appendix A (*Clay Object Database*) and Appendix J (Tier 3 Database).

SITE NAME	CLAY	STONE	PERCENTAGE STONE
'Ain Ghazal	133	30	18.40%
Aşıklı Höyük	5	0	0.00%
Canhasan I	2	0	0.00%
Çayönü	16	22	57.89%
Demirköy	0	4	100.00%
'Es-Sifiya, Wadi Mujib	78	0	0.00%
Gesher	0	3	100.00%
Hajji Firuz Tepe	28	0	0.00%
Hakemi Use	5	0	0.00%
Höyücek	25	0	0.00%
Jarmo	620	0	0.00%
Jericho	22	2	8.33%
Salat Cami Yanı	15	0	0.00%
Sarab	37	0	0.00%
Suberde	56	3	5.08%
Tell Arpachiyah	20	0	0.00%
Tell Halaf	7	0	0.00%
Tell Hemmeh	1	1	50.00%
Tell Kurdu	11	0	0.00%
Ulucak Höyük	12	0	0.00%
TOTAL	**1093**	**65**	5.61%

Table 9.2: Raw material of all tier 2 recorded objects. See individual entries in Appendix A (*Clay Object -Database*) for references.

RAW MATERIAL	NUMBER OF OBJECTS
Limestone-chalk	7
Basalt	1
Limestone	3
Brown Stone	1
Stone Total	12
Clay (inc. reused potsherd)	11
Uncertain, stone?	3
TOTAL	**26**

Table 9.3: Raw material of the viewed objects (n=23) at 'Ain Ghazal.

THREE-DIMENSIONAL SHAPE	NUMBER OF OBJECTS	% OF VIEWED OBJECTS
Sphere	11	42.31
Flattened/semi-sphere	5	19.23
Flattened/semi-ovoid	3	11.54
Cone 1 (round base)	2	7.69
Disc 2 (flat base)	2	7.69
Cone 4 (pinched)	1	3.85
Cylinder	1	3.85
Disc 1 (flat/convex base and top)	1	3.85
Total	**26**	**100**

Table 9.4: Table showing the number and range of three-dimensional shapes within the viewed assemblage (n=26) at 'Ain Ghazal.

THREE-DIMENSIONAL SHAPE	NUMBER OF OBJECTS	PERCENTAGE OF 'AIN GHAZAL OBJECTS
Sphere	98	60.12
Cone 1	22	13.50
F. /S. Sphere	16	9.82
Disc 1	11	6.75
Ovoid	4	2.45
F./S. Ovoid	3	1.84
Disc 2	3	1.84
Cone 4	**2**	1.23
Cylinder	2	1.23
Cone 2	1	0.61
Other/misc./Unknown	1	0.61
TOTAL	**163**	**100**

Table 9.5: 'Ain Ghazal objects by three-dimensional shape: viewed (n=26) and published (n=137) objects combined). (Includes data from Iceland 2010a & 2010b).

TECHNICAL CATEGORY OF TIER 1 "TOKENS" AT 'AIN GHAZAL
CATEGORY 1 *White to pale yellow in colour, fine grained, homogenous fabric. Most have a porous, friable surface, majority of these objects are likely of chalk limestone. A small number, however, perhaps three of 16* (*none studied petrographically*)*, appear to be of harder, fine-grained limestone. One is an unusual artificial mixture of chalk fragments and clay.*
CATEGORY 2 *Yellow clay, fine surface cracks, no macroscopically visible inclusions.*
CATEGORY 3 *Coarse brown clay, pale brown* (*10YR6/3*)*. Containing coarse marl and chert and charred organic material, fragments are ordinarily of the same colour interior and exterior.*
CATEGORY 4 *Dark greyish brown containing coarse marl and chert and charred organic material; fragments are ordinarily of the same colour interior and exterior.*
CATEGORY 5 *Light brown to pinkish grey, smoothed, hard surfaces exhibiting fire clouding.*
CATEGORY 6 *Smoothed fine very pale brown* (*"buff"*) *clay*
CATEGORY 7 *Category consists of several white chalk fragments- these were removed from the study assemblage-natural.*
CATEGORY 8 *Miscellaneous group, but includes several clay objects with variable reddish and greyish colours, in some cases exhibiting layered differences in colour in broken cross-sections, likely indicating a variety of firing conditions. Most likely, they were made from raw materials similar to those used for categories 3 and 4.*

Table 9.6: Summary of the main definitions and characterises of the 8 "Technical Categories" to which Iceland assigned each of the published objects (based on Iceland 2010a & 2010b).

ICELAND'S TECHNICAL CATEGORY	CLAY COLOUR	NUMBER OF "TOKENS"	% OF "TOKENS"
1	White	26	15.95
2	Yellow	18	11.04
3	Light Brown	55	33.74
4	Dark Brown	33	20.25
5	Red	7	4.29
6	Very pale brown	5	3.07
7	White	0	0.00
8-Other	Dark-Brown	6	3.68
8-Other	Red	6	3.68
8-Other	Buff-Grey/"light grey"	2	1.23
8-Other	Buff-White	1	0.61
8-Other	Orange	1	0.61
8-Other	Light-Brown	1	0.61
8-Other	Black	1	0.61
TOTAL		162	99.37

Table 9.7: Number and proportion of objects within each of Iceland's "technical categories" along with the main colour of the objects within each category (Includes data from Iceland 2010a & 2010b).

INCLUSION TYPE	PERCENTAGE OF OBJECTS
Mineral only	3.68%
Organic Only	0.00%
Mineral & Organic	66.26%
Unsure of Type	0.61%
None/not published/not clay	26.38%

Table 9.8: Presence and proportion of objects displaying inclusions at 'Ain Ghazal. (Includes data from Iceland 2010a & 2010b).

OVERVIEW:			DETAIL:		
PUBLISHED SHAPE	**STYLE OF "MARKING"**	**NUMBER**	**CO#**	**"MARKINGS" DESCRIPTION**	**NUMBER**
Cone	n/a	2	CO#s 1853 and 1854 (nos.15 & 13)	CO# 1853: "cone, long...punched under base, very high bent tip". CO# 1854: "cone, long with punctuations...punch marks, broken top"	2
Half-sphere	Groove	1	CO#1806 (no. 111)	"sphere with groove"	1
Sphere	Simple groove	7	CO#1810 (no. 101)	"sphere with multiple lines"	1
Sphere	Perfectly cylindrical punctuation (made with a blunt stylus)	1	CO# 1820 (no. 123)	"disc, flat...1 deep punch, prob. not intentional "	1
Sphere	Fine multiple lines	1	CO# 1826 (no. 129)	"disc, indented...squarish with 2 grooves "	1
			CO# 1832 (no. 119)	"disc, undefined...squarish, with groove along one edge "	1
	Total	**12**		**Total**	**7**

Table 9.9: "Tokens" published from 'Ain Ghazal displaying decorative markings. A total of 15 objects have markings; 7 as stated briefly in Iceland 2010a, described in more detail in Iceland 2010b.

MIDDLE PPNB SUB-PHASE	DATE (YEARS BC UNCALIBRATED)	NUMBER OF OBJECTS PER SUB-PHASE	MIDDLE PPNB SUB-SUB-PHASE	NUMBER OF OBJECTS, SUB-SUB-PHASE	% OF MPPNB "TOKENS", **n=115** (that can be assigned to a sub-phase)	% OF ALL 'AG CLAY OBJECTS STUDIED **(n=163)**
I	7,250-7,100	0	n/a	0	0.00	0.00
II	7,100-7,000	11	II	1	0.87	0.61
			IIa	2	1.74	1.23
			IIb	3	2.61	1.84
			IIc	4	3.48	2.45
			IIc/IId	1	0.87	0.61
III	7,000-6,900	35	IIIa	17	14.78	10.43
			IIIb	15	13.04	9.20
			IIIc	3	2.61	1.84
IV	6,900-6,800	69	IVa	60	52.17	36.81
			IVb	3	2.61	1.84
			IVc	6	5.22	3.68
V	6,800-6,500	1	n/a	1	0.87	0.61
TOTAL				**115**	**100**	**70.55**

Table 9.10: Chronological chart detailing phases of occupation at 'Ain Ghazal during the Middle Pre-Pottery Neolithic B period (MPPNB). 132 of the 137 published clay objects come from the PPNB and 129 from the Middle PPNB specifically. 115 of these can be further assigned to a sub, and sub-sub phase of the PPNB. (Adapted from Iceland 2010a & 2010b). All dates based on un-calibrated radiocarbon dates as published.

DESIGNATION AS PUBLISHED	SUB-DESIGNATION	CATEGORISED AS (*CLAY OBJECT DATABASE*)	REFERENCE (Broman Morales 1983)	TOTAL COUNT
"Cones & tetrahedrons"	"Cones"	Type 1 cone (round base)	p. 387-88 and Fig. 168: 3-4.	**106**
	"Tetrahedrons"	Type 3 cone (other-triangular base)	p. 388. Fig 168: 6-7.	**20**
	"Other cones"	Type 1 (roughly formed)	p. 388.	**35**
	"Pawn shaped cone"	Type 4 "pinched"	p. 388. Fig 168: 5.	**1**
"Balls and discs"	"Round clay ball" (including "small")	Sphere-perfectly rounded	p. 389; Fig. 169: 1, 2, 3, 4, 10.	**1,153**
	"Ball of one flattened side"	Sphere imperfect (a)	p. 389; Fig 169: 5.	**28**
	"Ball "	Sphere imperfect (b)	p. 389; No illustration.	**71**
	"Biconvex ball"	Sphere-rugby ball shape	p. 389; No illustration.	**12**
	"Small oval ball"	Ovoid	p. 389; No illustration.	**5**
	"Sub-hemispherical disc"	Semi-sphere	p. 389; Fig. 169.7, 8, 9.	**86**
	"Discs with flattened top and bottom"	Disc type 1 (flattened top and base)	p. 389; Fig. 169.6	**10**
	"Flattened discs"	Disc type 1 (flat top and base)	p. 389.	**206**
"Stalk"	"Nails"	Cone type-1 (round base)	p. 389; Fig. 167: 17-20; 168: 1-2).	**39**
Non-geometric forms: "Miscellaneous"	Characterised as flattened pieces with grass or straw impression, as well as others within none. Manipulated though not into any recognisable shape (unlike the "Misc." and "shaped pieces" below (Broman Morales 1983: 391-92).			**350**
"Clay lumps"	"Shaped pieces" (clear and deliberate yet shape does not fit into any of the functional categories used at Jarmo, n=150), "rod fragments" and "perforated objects" (Broman Morales 1983: 388-89).			**404**
			TOTAL COUNT RECORDED TOTAL	**1,772 620**

Table 9.11: List of the small clay geometric clay objects from Late Ceramic Neolithic Jarmo (Zagros region). The excavators' designation, and the designation used to record the objects onto the database, as well as the total number of examples referred in the publication are listed. A total of 620 objects from Jarmo are recorded individual at tier 2 level (see Appendix A: *Clay Object Database*).

SOURCE	DESIGNATION AS PUBLISHED	CO#	SITE REG. NO.	PERIOD	REFERENCE
Excavations at Jericho vol. IV (Kenyon, Holland 1982)-Appendix C "Figurines and Misc. Objects" Part C "Gaming Pieces"	"Gaming Piece "	1936	Reg. 455	Pottery Neolithic A	pp. 557-558, fig. 226.1 p. 557.
	"Gaming Piece "	1937	Reg. 184	Pottery Neolithic A	pp. 557-558, fig. 226.2 p. 557.
	"Gaming Piece "	1938	Reg. 185	Pottery Neolithic A	pp. 557-558, fig. 226.3 p. 557.
	"Gaming Piece "	1939	Reg. 12	Unstratified	pp. 557-558, fig. 226.4 p. 557.
	"Clay Cone"	1940	Reg. 2709	Pottery Neolithic A	pp. 557-558, fig. 226.5 p. 557.
Excavations at Jericho vol. IV (Kenyon, Holland 1982)-Appendix C "Figurines and Misc. Objects" Part G "Misc. Clay Objects and Vessels"	"Unbaked clay missile"	1941	Reg. 867	PPNB	p. 559, fig. 227.2.
	"Miscellaneous"	1942	Reg. 896	PPNB	p. 559, fig. 227.2
Excavations at Jericho vol. V (Kenyon, Holland 1983)- Appendix N "Misc. Small Finds from Jericho"	"Gaming Piece "	1943-58	Reg. 2387, 2264, 2764, 2875, 2886, 1131, 645, 1429, 2031, 3286, 643, 1129, 3074, 635 and 3083	PPNA (n=6), PPNB (n=8),and Pottery Neolithic A (n=2)	p. 815, fig 367.1-16 p. 560
Excavations at Jericho vol. V (Kenyon, Holland 1983)-Appendix A "Stone Vessels, Tools and Objects"	None	1959	Reg. 2264	?	p. 513, pl. 10.g

Table 9.12: Detail of the n=24 clay objects recorded from Neolithic Jericho, southern Levant.

THREE-DIMENSIONAL SHAPE	NUMBER OF OBJECTS	SHAPE DETAIL
Cone type 1 (round base)	25	Objects published as "flat cones" are recorded on the *Clay Object Database* as "semi-flattened sphere" "Cone" variability: -Some/many are pinched -Some have a concave base -Some are pinched at the waist -Many/most have a round base -Base to side edge may be either sharp or rounded, regardless of whether the base is concave or flat. Base: -61% of all published "cones" (including those as "semi-sphere") have a "concave" base: caused by turning and the manual manipulation of the object. Mainly found on the larger examples. -35% of all published "cones have a "flat" base
Cone type 4 (pinched)	1	
Cylinder	1	n/a
Disc type 2 (flat base)	1	n/a
Semi-sphere	10	"Flat cones" are recorded as "semi-flattened sphere"
Other	4	n/a
Sphere	36	-All plain -Wide range of weights -No set classes of weights - All appear evenly round aside from one: described as oval in section and rectangular in plan view yet described as a sphere.
TOTAL	**78**	

Table 9.13: Detail of the three-dimensional shapes of the objects studied from Late PPNB Es-Sifiya, Wadi Mujib. (Data from Mahasneh & Gebel 1998: 108, fig. 1 p. 108).

PUBLICATION DESIGNATION	DESCRIPTION	TOTAL	PUBLISHED IN DETAIL	RECORDED, CO#s	REFERENCE
Abstract: stalk object	A total of 24 "Abstract "Stalk" Objects" were recovered from Çayönü. These are described as being cylindrical rods which taper towards the top.	24	3	2649-51	Broman Morales 1990: p. 64-65, 71-72, 74, Plate 5., h & I p. 84
Abstract: stud object	Both examples are quite different. This example is cone shaped (even though illustrated upside down) with a convex base and pinched waist. Round base in plan view which is slightly convex. The tip is fragmented though appears to have been pointed. The second is example is diablo/hour glass shaped. Described as: small, well moulded of fine grained clay, very smooth and hard. This example is hour-glass shaped with round ends in plan view-these are concave and one is slightly larger than the other. The object stands easily on end. It is very well made and regular in shape: cylindrical shaped-pinched in the middle to nearly half of the original width in section/longitude view (max. width is 1.30 cm, min width is 0.50 cm).	**2**	**2**	2653-54	Broman Morales 1990: p. 65, 71-72, 74, Plate 5. m & n-p. 84
Non-classifiable: disc-shaped object	35 objects from Çayönü are classified as "Disc-Shaped Object" though they are published as showing "considerable variation in form and size. Some are lenticular (type 3 on the *Clay Object Database*); others have a flat top and base (type 1).	**35**	**6**	1993-96	Broman Morales 1990: p. 66 -67, 71-72, 75, Plate 6 nos. f to k, p. 85
Abstract: cone	Described collectively as being small with base diameters of 12-15.5mm. One is smaller at 9mm diameter. The sides of all slope straight up from the flat, round bases. All are well fired and quite hard. All are identical. They are classified as a sub-category of the "stalk" objects rather than geometrics at this site though in form they are very similar to the cone-shaped "Abstract "Stalk" Objects".	**7**	**1**	2652	Broman Morales 1990: p. 66, 71-72, 74, Plate 5. j p. 84
Non-classifiable: cylindrical-shaped object	One of two Çayönü objects classified as "cylindrical" though only one is a true cylinder in shape. One has a ridge on running the length of one surface, it is round in section view and the ends are rounded. Finger-tip depressions are also clear on the length of one of the sides.	**2**	**1**	2655	Broman Morales 1990: p. 66, 71-72, 74, Plate 5. l p. 84
Geometric: Ball-shaped object	Some of the balls are completely rounded, others have one or more flattened surfaces.	**43**	**1**	2656	Broman Morales 1990: p. 66, 71-72, 75, Plate 6. e p. 85
Geometric: Disc-shaped object	Described as having "considerable variation in form and size".	**35**	**1**	2568	Broman Morales 1990: p. 66-67, 71-72, 75, Plate 6. d p. 85
Geometric: Flat ring disc-shaped object	Ring shaped- (only half present): flat top and base disc with large perforation in centre.	**3**	**1**	2657	Broman Morales 1990: p. 67, 71-72, 75, Plate 6. l p. 85
Pawn-shaped	22 identical polished limestone cones standing "about three inches high". The objects are well crafted, and very regular in shape with a flat base.	**22**	**22**	2659-80	Çambel & Braidwood 1979: 149 lower illustration: b.
	TOTAL	**173**	**38**		

Table 9.14: Overview of the n=173 geometric objects recovered from Çayönü, of which n=38 are individually illustrated or described in enough detail to be recorded at tier 2 level (see Appendix A: *Clay Object Database* and figure 2.21).

DESIGNATION:	**"CONES"**
CATALOGUE NUMBERS:	HF68-104, HF 68-107, HF 68-158, HF 68-170, HF 68-171, HF 68-172, HF 68-189, HF 68-190, HF 68-195& HF 68-212.
OBJECT TOTAL:	n=10, CO#s 1960-1969.
ILLUSTRATIONS:	Plate 27.i-q (9 examples). Figure 102.a-b p. 183 (2 examples)
DESCRIPTION:	-"Fine small cones with rounded tops. 1.5-3.00cm in height" -Clean clay with fine/sparse vegetal inclusions. -Lightly fired -Light grey interiors -Surface colour ranges from grey to brown -Surfaces all smooth but matte (not burnished) -No wear patterns though some chipped
DISCUSSION:	-Discussion based on Schmandt-Besserat's -Discusses the wide distribution of cones across early villages in the Zagros
DESIGNATION:	**"MISCELLANEOUS GEOMETRICS"**
CATALOGUE NUMBERS:	HF 68-81, HF 68-114 &HF 68-216.
OBJECT TOTAL:	N=3, CO#s 1970-1972.
ILLUSTRATIONS:	Plate 27.g-h (2 examples). Figure 102.c-e p. 183 (3 examples)
DESCRIPTION:	-Small artefacts of untempered clay Smooth -Hand fired **Three different shapes of similar size:** -hemisphere (1.0cm dia.) -irregular ball (1.0cm dia.) -nipple-like disc (1.0cm dia. x 2cm height)
DISCUSSION	-Based on Schmandt-Besserat -The "nipple" is said to be unique
DESIGNATION:	**"SEALINGS"**
CATALOGUE NUMBERS:	HF 68-193, HF 68-194, HF 68-219, HF 68-223, HF 68-224, HF 68-229, HF 68-264, HF 68-265, HF 68-272, HF 68-273, HF 68-274, HF 68-275, HF 68-276, HF 68-277 & HF 68-278
OBJECT TOTAL:	N=15 CO#s 1973-1987
ILLUSTRATIONS:	Plate 28.a-f (6 examples). Figure 102.f-g p. 183 (2 examples).
DESCRIPTION:	-Some are lightly fired or sun baked. - Formed by pressing the clay onto another object. -All broken edged -Some fragmentary. -The largest and complete items are those that were pressed into a cylindrical object (i.e. HF68-193 and 194) -Thinner examples were pressed onto reeds and flat surfaces (i.e. HF 68-:265, 272, 274) -The paste of clay is very variable *Also see at Ganj Dareh* (*Smith 1972 p. 167*) *and Jarmo* (*Broman 1958 p. 70*).
DISCUSSION	-Notes sealing -like objects have also been found at nearby Ganj Dareh Tepe (Smith 1972: 167) - Jarmo also has pieces of untempered clay with straw, grass and matting impressions. -Suggests simple sealings like these (unstamped jar stoppers) are therefore likely widely distributed, just unreported

Table 9.15: Detail of the clay objects from Hajji Firuz Tepe. All figure reference relate to Vought 1983. (Voigt 1983: 181, 184-85).

PHASE	CHARACTERISTICS
Site divided into: -Phases A – H -**Phase A** – most recent (Chalcolithic) -**Phase H** – oldest (begins early 6th millennium cal. BC)	**The mound:** -Oval mound -Measures 200m x 140m -Stands at 10.3m above the surrounding plain -2.8ha. / 28,000m^2 **General Characteristics** (of the Neolithic/6th millennium BC buildings): - Generally free standing square/ rectangular units -Generally aligned along the cardinal points -Often have an unroofed area to the east – curved or rectangular
Phase H	-Similar to F -Structure XII continues from phase to F to H - Structure XI is gone -Yet it is replaced by structure XIV, again abutting structure XII, yet slightly to the north
Phase G	-As Phase F
Phase F	-Single very small operation -Two structures -Built at an angle to one another -Touching side by side -Both have partial walls dividing the main space into two -This is further subdivided with two small bins less than 2m diameter
Phase E	-Single, small exposure -Within operation V and IV -One building – Structure X which continues into phase F
Phase D	**-Some different forms of building appear** in this phase compared to previous phases (E and earlier) -Square buildings with internal walls continue -Also have small buildings: more compartmentalised -Structures IX, X, VI and VIII **-Tokens all found in this phase-in Structure VI**
Phases C and later	- Similar character of buildings represent phases A (Chalcolithic), B and C -Five buildings are exposed in phase C -All of similar sizes -Dense occupation **Phase C:** -Two contain "porch like" features: a curved open all at the front of the building -Some have internal hearths -Some have both internal and external -Others have none -Most have partial internal walls

Table 9.16: (a) General site characteristics by phase of occupation at Operation V Hajji Firuz Tepe (6th millennium cal. BC, Zagros region) (Voigt 1983: 31, 23, 25, 28, 29, 31, 548. Figs 13, 15, 17, 18, 19, 20). See figure 9.40 for plan of Structure VI of phase D.

ARTEFACT DESIGNATION	PHASE			
	A	B	C	D
Cones	1	2	1	6
Miscellaneous Geometrics	1	2	0	0
Sealings	0	11	1	1

Table 9.16: (b) Contextual distribution of the geometric shaped clay objects compared to sealings at Hajji Firuz Tepe by phase (objects excavated in the main season, 1968 only). (Adapted from Voight 1983: table 27 p. 164).

CONTEXT DESCRIPTION	NUMBER OF CLAY OBJECTS	PHASE AND DATE
The entire phase, named the "Sanctuaries Phase" is identified as such, mainly to the kinds of objects found within them. Three "sanctuaries" were identified, none of which are actual buildings. Pieces of flooring, partial walls and so on were identified (though these may have been platforms rather than actual covered, walled buildings. All contain large collections of enigmatic objects, and objects not found, or found rarely and only singly in other areas of the site. In the sanctuaries are large caches of such items together making the deposits distinct.		Sanctuaries Phase (SP) Late Neolithic, c. 5,900-5,700 cal. BC
Sanctuary identification: **-** Paved area (mud-bricks/clay slabs) in square K5 -Two parallel walls (excavator suggests these slabs were originally vertical, they later collapsed, burring the internal objects underneath them) -Underneath were many **"ritual" objects** (n=54) including: -clay figurines x8 -clay idols x20 -stone idol head x1 -clay ladle x1 -pot stand x1 -arrow head x1 - rectangular prism shaped objects x6 -lumps of clay x10 -discs x5	**"Many" geometrics including:** -"rectangular prisms" -"clay lumps" -"cylindrical shaped objects" -"disc shaped objects"	First "sanctuary"
Identification: -Based on presence of finds similar to those in Sanctuary 1. -These "ritual" finds were recovered from a seemingly open area in the same square(boundaries unclear) -Square K5/L5 -Covers a space $3m^2$ **Features:** -A short north-south wall 75). -A plastered "floor" **Objects:** -n=49 -No clay geometrics -No clay lumps -Otherwise similar objects to sanctuary 1 (not individually published)	None	Second First "sanctuary"
Site interpreted as an extraordinary settlement: -A Pilgrimage site on a hill for people from the surrounding Burcak plain -People visited for ceremonies only -Höyücek at this time was <u>not</u> a settlement site but a religious cult centre with open air platforms.	None	Sanctuaries Phase

Table 9.17: Detail of the context of the small geometric objects recovered from Late Neolithic Höyücek "Sanctuaries Phase" dated to c. 5,900-5,700 cal. BC. The First "sanctuary" contains a number of tokens, whilst the second and third are similar in all feature, aside from the notable absence of clay objects. (Anatolian Lake District); interpreted objects for ritual use, due to their context. (Umurtak 2007; Duru, & Umurtak 2005: 174-77).

SITE	STORAGE EVIDENCE	DATE/PERIOD	NUMBER OF TOKENS REPORTED
Suberde	-Immovable storage silos -Cylindrical shaped -70-80cm diameter -Stand upright -Sides made from clay, 2-4cm thick -Supported with earth and buried into the ground -*Assumed* for storage, yet no direct evidence of this found -Found at all three levels (Levels I, II & III) of settlement	-Upper phases of Levels III and all phases within Level II correspond to earliest levels at Çatalhöyük (East). -Level III (oldest): radio carbon dated to c. 6,500-6,000 cal. BC.	59
Höyücek	-Multiple storage bins of various sizes -Located: -Inside buildings -Work areas -Courtyards -Four sides bins, made from separate clay plaques joined together (as at Bademağacı) -Many silos found full of sorted, and separated grain of various kinds (including einkorn, naked wheat, legumes, burnt wheat)	-Shrine Phase (Early Neolithic c. 6,500-6,000 cal. BC)	25 (All date to latter-Sanctuary Phase)
Bademağacı	-Widespread storage: 4 sets of silos present in a settlement of 9 houses. -Up to six square boxes are fitted together to form a large silo (each box is made from separate clay panels joined together to form a box, sharing common sides when multiple boxes are joined) -Located in open area only: in-between buildings -Interpreted as communal -Total of 12-13 boxes across all 4 silos (in a settlement of 9 houses) -Capacity estimates: not enough to feed the village for one year (based on modern village family consuming 750kg of grain per year) -No grains or residues found inside any silos. -Have recovered two small bowls and two small jars from inside silos: could have been used as scoops to remove the grains/contents	-Recovered from various levels of settlement (site occupation: 7,000-6,200 cal. BC) - Earliest storage bins: EN II/4B level.	None
Hacilar	-Square bins, similar to those at Bademağacı and Höyücek, yet plastered after plaques were fitted together. -Stand at least 1m tall -All found inside houses only -Either inside "kitchens" of houses, or along internal, adjoining walls -Produce found *in-situ* inside many (including pea, lentil and barley).	-Level V (c. 5,500-5,400 BC)	None

Table 9.18: Summary of the storage evidence from Anatolian Lake District sites: Suberde and Höyücek (both contain clay objects), Hacilar and Bademağacı Höyük (no clay objects reported). (Bordaz 1973: 285; Bordaz 1968: fig. 6, 46-7, Umurtak 2007: 1-8). Also see figures 3.5, 3.6 and 9.41.

CHAPTER 10: DISCUSSION & INTERPRETATIONS

10.1-INTRODUCTION

In order to answer the research questions posed in Chapter 1, the main similarities and differences of clay object assemblages, their context, and the nature of the sites from which they come from, all need to be assessed. The nature of the functioning of clay objects cannot be understood in isolation; especially if, as proposed by some, they operated as part of an inter-site system of administration. Settlements within the Neolithic of the Near East are united by a number of shared characteristics, yet there is also diversity within the zone, which can be used to sub-divide it into smaller regions and time periods representing groups of sites that share many practices (as detailed in Chapter 3.3). Now that assemblages of small geometric clay (and stone) objects from a range of sites across a variety of locations and time periods within the Neolithic Near East have been examined, what can be deduced with regards to the questions posed at the start of this thesis? Why did the occupants of the world's earliest villages choose to make these items and why are they only found at some sites? How were they used? How might they have aided life in these early village communities? Were they, as Schmandt-Besserat suggests, part of a set symbolic system? Not only used in the same way across the entire span of the Near East and duration of its Neolithic period, but also acting as part of a shared symbolic system; with each type and style of clay object (i.e. its shape, size, colour and decoration) having an immediately recognisable meaning, one which was consistently understood throughout the Neolithic, across the region, regardless of the location, size, subsistence practices of the community in question. These questions will be investigated below, utilising evidence from the case-study sites; supported by evidence from clay objects studied at tier 2 and 3 level.

10.2- CASE-STUDY SITES:

COMPARATIVE ANALYSIS

(i) Site Nature

Both Boncuklu Höyük and Çatalhöyük share relatively close geographic and temporal proximity, with Tell Sabi Abyad acting as a comparative example of a more distant site. Located on the Konya plain of the Central Anatolian highlands, at an elevation of over 1,000 m; Boncuklu and Çatalhöyük are just 9.5 km from each other (see figures 4.4 and 4.1-2). They share a similar geographical environment and climate (Chapters 3.2, 4.1 and 4.2); providing access to a similar range of plants, animals and raw materials. Tell Sabi Abyad in contrast, is located over 700 km away, in the plains of Upper Mesopotamia. A considerable distance from the other case-study sites, Tell Sabi Abyad

is also located in a different environmental zone (Chapters 4.3 and 3.2), and just 200 m above sea level. Strategically placed to the north of the Euphrates River, close to the banks of the Balikh River. Tell Sabi Abyad sits in the fertile Jazira region (figures 4.3-1 and 4.1).

Boncuklu Höyük is the oldest of the case-study sites, occupied from the latter part of the 9th, into the first half of the 8th millennium cal. BC (figure 10.1). The latest phases of occupation are yet to be dated and it is possible the final phases of occupation at Boncuklu just precede or are contemporary with the earliest levels of settlement at Çatalhöyük (where settlement has been dated to c. 7,400 to 6,200 cal. BC). This close geographic proximity and temporal continuity allows questions of the development and evolution of clay object use through time to be considered, especially as the residents of Boncuklu Höyük are assumed to be some of the ancestors of Çatalhöyük (Baird *et al.* 2012: 219, 220-21: Baird 2007: 15). Tell Sabi Abyad has the longest duration of occupation, spanning the late 8th into the early-to-mid 6th millennium cal. BC; thus with a considerable period of simultaneous occupation to Çatalhöyük. Therefore, temporally, the three case-study sites cover almost the entire span of the Near Eastern Neolithic, allowing continuity and change though time to be assessed.

Significant variety can be seen in the scale of settlement across the case-study sites. Çatalhöyük is by far the largest (13.5 ha.); with dense, seemingly cohesive and simultaneous tell- wide occupation, giving the site the character of a large town or city (figures 4.2-2, 4.2-5a and 4.2-6). Also sizable, Tell Sabi Abyad has a different nature of occupation. The main tell does not appear to have been simultaneously occupied, rather settlement moved across different, smaller areas of the main tell through time and also across the satellite mounds (figures 4.3-2, 4.3-3, 10.3 and table 4.3-1). The nature of buildings and density of settlement and village layout varies across these different occupations (see Chapter 4.3). The most well exposed and researched villages are those of operation I (on the main tell), especially the level 6 Burnt Village which has revealed densely packed village with buildings-both round and rectilinear co-existing (figures 4.3-15, 4.3-16 and 4.3-17). Large freestanding ovens are found both internally in open air courtyards attached to buildings and in open spaces between buildings. Small, free standing storage structures (i.e. building VI) as well as larger buildings subdivided into or containing a number of small, seemingly storage rooms (such as buildings IX and XI), are present (see plan figure 4.3-16). Those buildings solely comprising small units are interpreted as communal storage units: with each family,

household, or individual placing sealed containers into a unit-marking their personal property, with each unit within a building possibly having a different owner (Akkermans & Duistermaat 1996). The huge number of clay sealings, almost all displaying stamp seal impressions and found in a number of levels and areas of the site at Tell Sabi Abyad, attests to their wide scale use to mark ownership, access or control at the site.

Though heavily evidenced, storage at Çatalhöyük is of a different nature. No communal or external storage facilities have been uncovered and all storage evidence comes from within the private, internal domestic space (see figures 4.2-10 and 4.2-11). Even if some items were stored externally (on house roofs for example), in baskets, bags or tied bundles, it appears that residents had no need to attach sealings to these to mark ownership. Perhaps such practices were either not carried out or as goods were only placed inside the domestic space, or on one own roof top, ownership was clear (no stamp seal impressions nor definitive sealings have been recovered from the site to date). Boncuklu Höyük is a tiny settlement in comparison to Çatalhöyük and Tell Sabi Abyad, at a maximum of just 1 ha. Buildings are spread out with large open work and disposal areas (middens) separating them (Chapter 4.2 and figure 4.1-3). Little clear evidence of storage is attested, although a possible storage cell attached to the side of a typical oval building in Area N has recently been excavated (Baird pers. comm.).

(ii) Small Geometric Clay Objects

At each case-study site, hundreds of clay objects have been excavated. Almost all the known clay objects have been studied from Boncuklu Höyük and Çatalhöyük, contrasting with the smaller studied proportion of Tell Sabi Abyad's estimated total clay object assemblage (figure 10.2). Comparison of the number of studied clay objects, alongside site size shows disparity in terms of site size and the number of recorded and estimated total number of clay objects per site (figure 10.4 and table 10.1). Each of the case-study sites has a comparably large estimated total number of clay objects, yet the differing size of the case-study sites means clay objects are most common at Boncuklu Höyük, and Çatalhöyük. This is intriguing, considering the fact that Boncuklu is the earliest site, the smallest and least dense settlement, employing a mixed forager-farmer subsistence strategy and with the least evidence of storage. However the differing excavation and retrieval strategies carried out, especially at Tell Sabi Abyad compared to Boncuklu Höyük and Çatalhöyük (see chapter 4), with regards to the proportion of

sediment floated and sieved is likely to have affected the total numbers of recorded finds of various artefact categories recorded at each case-study site.

The clay objects across the three tier 1 sites share a number of similarities. A range of the basic three-dimensional shapes are represented, demonstrating a common set of shapes are found at all three sites. However certain shapes are lacking from each site (i.e. cubes and type 4 cones at Boncuklu, cuboids at Tell Sabi Abyad) and the proportion of shapes present varies from site to site (figure 10.5). Likewise, there is diversity in the level of craft, and the degree of standardization within each three-dimensional shape category, which both increase chronologically across the three case-study sites. In weight, all objects cluster around the same ranges, yet clay objects from Tell Sabi Abyad are heavier overall (table 10.2), absent from the lightest weights and peak in number at a heavier range (figure 10.6). None of the tier 1 sites demonstrate sets of clay objects of specific sizes within a shape category-there are not sets of "large", "medium" and "small" cones for example, but objects within each shape are present in a graduated and non-standardized range of sizes (though exceptions can be seen in sub-groups of objects of specific shapes at both Çatalhöyük and Tell Sabi Abyad, the "mini-balls" for example). Clay objects from Boncuklu are more likely to be fragmented (figure 10.7), it is also the only site where no stone examples have been recovered (figure 10.8). The Tell Sabi Abyad assemblage stands out for having the highest proportion of clay objects with intentional decorative "markings" (figure 10.9). Across the three sites, the range, combination and dominance of designs varies (see Appendix I figure A.I-8 and table A.I-3) and there is no correlation between three-dimensional shape, the presence of markings or their format. Singular distinctive objects or homogeneous groups of objects sharing a number of characteristics stand out from the main assemblages, such as the small "mini" balls and the stone spheres at Çatalhöyük (see Appendix D). Tell Sabi Abyad has the distinctive "bullae", as well as the notched cylinder, the "gaming piece-Token?", the anthropomorphic cones and the stone cube. Boncuklu Höyük is lacking in such clearly distinguishable sets of, or singular distinctive clay objects, though there are three objects similar in shape, size and most importantly-the location and style of marking (figure 6.6 and table A.B-4).

(iii) Distribution of Clay Objects Within Sites

At all three case-study sites, there is a degree of temporal variation in the number of studied clay objects from each site's respective *earlier* versus *later* phases of occupation. This variation is negligible at Boncuklu Höyük which has slightly more clay

objects in the earlier phases (n=178 compared to n=138, figures 6.21, 10.10 and discussion in Chapter 6.3). At Çatalhöyük, three quarters of the recorded clay objects come from the later, post Mellaart Level VI phases (figure 10.10). In addition, the zoomorphic figurines and "mini" clay balls of the tier 2 assemblage at Çatalhöyük follow this tendency (with almost all "mini balls" coming from the later phases. See Appendix D, especially figure A.D-1a and table A.D-5). The trend for a later Neolithic increase in clay object counts is even more pronounced at Tell Sabi Abyad where less than 10% of the studied assemblage comes from pre-ceramic levels at the site (see Chapter 8.3, figures 8.38 & 10.10 and tables 8.15 & 8.17). There are many variables to consider with this data: disparities in the size of the area and density of sediment excavated in one phase compared to another. Yet these overarching trends are reflected in tentative density analysis (at Boncuklu Höyük: figure 6.17 and Çatalhöyük: figures 7.17, 7.19; table A.C-8) and in the number of clay objects by broad Neolithic phase within discreet site areas (at Çatalhöyük: figure 7.17 and Tell Sabi Abyad: tables 8.15 and 8.16).

Though difficult to discern due to problems with the reliability of density analysis and the differing proportions of sediment excavated across various phases of settlement; analysis of the detailed phase of occupation (possible for Çatalhöyük and Tell Sabi Abyad only) enhances this picture. Considering the *number* of objects per-"Hodder level" of occupation at Çatalhöyük, a huge 62.54% of all North Area (over one quarter of all Çatalhöyük objects) studied clay objects come from just one level of occupation, 4040/North.I. (n=177) which lies within the post-Mellaart level VI (*later* Neolithic) occupational phase (figure 7.18 and table A.C-7). Similarly, more than one third of Çatalhöyük's South Area clay objects (38.93%, n=93) come from a single phase, South.P. which again lies within the broader *later* Neolithic phases of settlement (see figure 7.18 and table A.C-7). Notably, analysis of the number of tier 2 "mini balls" (n=1,254) follows the same differential temporal distribution pattern with the overwhelming majority found in the *later* Neolithic phases, and in two particular levels across the two largest excavation areas: 4040/North.I. and South.P. (figure A.D-2).

Density analysis of the Çatalhöyük assemblage provides a slightly different picture (figure 7.20). In the North Area, clay object density peaks in two levels (4040.?G. and 4040.I.), thus each broad phase of settlement *earlier* and *later* Neolithic, evidences a clear increase in clay object density through time, and the high number of objects in 4040.I. reflected in an equally high density (figure 7.20 and table A.C-8). In the South Area, clay objects are high in number, yet low in density in South.P. They are most

dense in South.L, within the *earlier* phases of Çatalhöyük settlement in opposition to analysis of number per phase. Yet the sample size for South.L. is negligible, making these results unreliable (see table A.C-9: Appendix C for details).

Like Çatalhöyük, evidence from Tell Sabi Abyad shows a clear case of the concentration of clay objects in specific areas and phases of settlement. Operation I (main tell) covers just 0.5 ha. and is occupied over 6 stratigraphic levels. 86 clay objects were recovered (at tier 2 and 2 level) from operation I, yet n=69 (80.23%) come from a single level, level 6 c. 6,000 cal. BC (figure 8.38 and table 8.16). This trend is enhanced by the tier 3 information, where a similar proportion, 167 of the operation's 197 published "tokens" (84.77%) were recovered from level 6 (table 8.17; though as discussed in Chapter 4.3 this concentration may be due in part to biases the site's retrieval processes). A similar concentration of "tokens" within one phase of settlement, in one area of the site, is hinted at in the limited excavations in operation II, which have revealed 4 bullae in addition to 57 "tokens" (not fully published, tier 3. See table 8.17) within a single $10m^2$ excavation square, main tell, though these are distributed across a number of levels within this short-lived phase of site activity.

Tell Sabi Abyad shows a genuine variation in the degree of clay object use, mirrored in two different areas of the site, in roughly contemporary time periods (see chronological chart table 4.3-1). This variation likely suggests different depositional practices of clay objects within these levels, rather than major economic changes in certain levels of occupation. Both the operation I and II clay objects come from intentionally burnt buildings. Though there is variation in the distribution of the clay objects of operation I, with objects concentrated in specific rooms of certain buildings only (see Chapter 8.3 and tables 8.23 & 8.25), excavations at Tell Sabi Abyad have not revealed any other burnt villages or buildings which demonstrate an absence of clay objects. Therefore these burnt operation I and II contexts can be interpreted as rare, surviving examples of what must have been more common place storage buildings housing caches of clay objects, sealings and related artefacts. Similar economic activities also involving comparative clay objects are likely to have continued into Tell Sabi Abyad's Early and Middle Halaf phases (i.e. post c. 6,000 cal. BC), and been used in the pre-Halaf phases also, yet the burning of the buildings of level 6 operation I, and all excavated levels of operation II has preserved these remarkable practices *in situ*.

(iv) Nature of Context

Almost half of Boncuklu's recorded small geometric clay objects were retrieved from midden contexts (47.58%), with less than 1% coming from a deposit on an internal floor surface. This may be misleading as in terms of density, initial analysis suggests clay objects are most commonly found in burial fill, pit fill and on floor surfaces (very small sample sizes are associated with these context types) (table 6.4 and figure 6.10 and 6.19) and in clusters around certain features (figures 6.12 and 6.13). Similar patterning is true of the Çatalhöyük assemblage; midden fill is again the find spot of a large proportion of recorded clay objects (41.65%; figure 7.21 and table 7.9). The additional (tier 2) small stone spheres, quadruped clay figurines at Çatalhöyük follow this trend, though the "mini" balls differ; over half (59.7%) come from buildings, and of those, more than 400 come from cluster contexts (see A.D-3 and A.D-4).

The nature of the context of Tell Sabi Abyad' clay objects is a little different and more convincing in terms of tentative functional interpretations. Again here, a significant proportion of clay objects come from midden-like deposits: recorded as "general fill" (19.08%) or "ashy fill layers" (15.52%) of an unspecific nature, yet in contrast, a smaller yet still significant sample size also come from "room fill" (figure 8.42 and table 8.19). Considering the location of the "fill" or "structural" deposit in which each clay object was retrieved, although "open areas" (of no notable features) dominate (57%; figure 8.44), significant proportions of clay objects come from contexts located within buildings (n=121 or 30.79%; figure 8.44 and table 8.20,), of which 33 objects come from "room fill" contexts (tables 8.19, 8.23 and 8.25,).

Only three clay objects were found *in situ* inside buildings at Çatalhöyük (table 7.13) and none at Boncuklu, yet at Tell Sabi Abyad, a great number of clay objects were recovered *in situ*, on the floors of buildings, many as part of artefact clusters (i.e. in V6 operation II: see figure 8.58 and tables 8.29 to 8.31). Indeed, at Tell Sabi Abyad, more than one quarter of studied objects were retrieved from an artefact "cluster" with burnt buildings within operation I (level 6) and II yielding remarkably high densities of clay objects and sealings (8.46 to 8.52, tables 8.22 and 8.24). Despite the apparent grouping of clay objects in specific locations, no clay objects come from deposits recorded as "artefact clusters" or caches at Boncuklu Höyük (table 6.4), whilst a mere 9 objects (1%) from Çatalhöyük were found in caches or clear artefact "clusters" (table 6.11). The distribution of clay objects at Boncuklu and Çatalhöyük shares a number of characteristics. Though the former site shows no *in situ* deposits or clusters of clay

objects, spatial analysis of the find spots of various artefacts demonstrates that clay objects were often recovered from contexts on the edge of hearths (as seen in Building 5, Area H, also in Area K. See Chapter 6.3 and figures 6.16-6.17). These examples suggest the clay objects were used inside buildings, near the hearth, as well as in external, midden based activity areas (see Chapter 4.1) before being disposed of in middens. The limited number of clay objects found inside Çatalhöyük's buildings, and their similar concentration in middens surrounded by houses suggests a similar scenario of use-location at Çatalhöyük.

The tier 1 small geometric clay objects, rather than forming one clearly identifiable artefact category- "'tokens", more likely resemble a number of divergent artefact assemblages, united both within, and across the three sites by similar manufacture and visual characteristics, but with multiple assemblages of clearly distinct types. As the objects are crafted from clay (an abundant, locally sourced, ubiquitous raw material at all three sites), and were easily sculpted, the intrinsic value was not within the objects themselves but in the meaning imbued to them upon production and use. This factor, alongside their presence in huge quantities in some phases of settlement, suggests the objects may have had a short life span, being crafted when required and readily disposed of shortly after use rather than being archived and re-used over a period of time. This is supported by the relatively low proportion of objects displaying signs of heavy wear; while a small number of clay objects are heavily worn, they retain a well-formed, distinct shape. Boncuklu Höyük was occupied for up to 1,000 years, Çatalhöyük and Tell Sabi Abyad for even longer; yet geometric clay objects are present throughout all Neolithic phases at each site, with little change in the character or range of objects evidenced temporally at any site. Combined, the case-study sites span almost three millennia, and comparing the earlier clay objects from Boncuklu Höyük with those from Tell Sabi Abyad, it is clear that those from the latter site are overall more refined and far more likely to display intentional markings.

This comparison of the nature of the case-study sites, along with their clay object assemblages and the distribution of them, highlights the subtle differences evidenced between the sites. These differences and similarities are crucial in assessing the possible function of geometric objects, especially in a consideration of the diffusion of cultural practices within the Neolithic Near East. At all three case-study sites, the presence of small geometrics in almost all levels of settlement, covering a long duration of time at each, could suggest their role changed little over the course of each sites

occupation. Yet, as seen in Chapters 6, 7 and 8, these apparently simple and homogeneous artefact sets have many subtle differences and may have functioned as multiple, independent sets of objects, in different spheres of life within each case study site and the wider Near East.

10.3- THE WIDER NEAR EAST

Aside from the case-study sites, the clay objects studied individually from the twenty tier 2 sites (Chapter 9) highlight the wide distribution of similarly sized and shaped small clay and stone geometrics. These objects, sharing a number of similarities in terms of appearance and craft are found across the entire span of the Near East, from the inception of the Neolithic period, to its final phase and beyond. A study of 56 additional (tier 3) sites and their estimated total number of clay objects (or the apparent/definite absence of clay objects) adds to the understanding of the distribution of clay objects in the Neolithic Near East (Appendix J). Combined, all studied sites cover a broad range of time periods, geographic regions and climatic zones (figures 10.11, 10.12 and 10.13). Considering the tier 2 and 3 sites, there is no wider pattering evidenced in the presence or (apparent) absence, nor the number or style of small geometrics according to any variable noted (table 10.3).

Small clay or stone geometrically shaped objects are found not only at sites across the temporal and geographic breath of the Neolithic Near East, but also at sites interpreted as temporary or semi-permanent camps of mobile communities (either independent, or perhaps task groups from nearby sedentary communities such as 10th millennium Gesher), seemingly non-residential "ritual" sites (for example Höyücek "Shrine Phase" and 7th millennium, BC Kfar HaHoresh; though the interpretation of these as purely ritual and non-residential sites is not convincing), large, permanent towns and "mega-sites" or cities (10 hectare Çatalhöyük and 'Ain Ghazal, up to 20 hectares) and at small sites of just 100 m diameter (such as 6th millennium Yarim Tepe I). Clay objects are found at sites with clear and extensive storage facilities (i.e. 8th-7th millennium Suberde). They are also present at sites with monumental architecture (PPNA Jericho and Çayönü), and at settlements with very dense buildings (Tell Sabi Abyad) and those with very few structures alike (Boncuklu Höyük). The clay object assemblages vary across sites in terms of number, style and proportions of different shapes, yet the similarities are more obvious than the differences.

At many sites, although only a small proportion of clay objects are decorated, fingernails are used to make decorative impressions in the clay, seen at small and large sites, across the region and duration of the Neolithic. This is evidenced on clay objects from a diverse range of sites; all three case-study sites (Boncuklu Höyük n=3, Çatalhöyük n=13 and Tell Sabi Abyad n=30; see Appendix A and figure 8.14); also on geometrics from Tell Arpachiyah, (6th millennium cal. BC Upper Mesopotamia, CO# 884) Gesher (small, single phase 10th millennium BC village, Southern Levant; CO# 1691), Sheikh e-Abad (10th millennium Zagros), 'Ain Ghazal (8th to 6th millennium) and Sarab (7th to 6th millennium cal. BC Zagros site) (figure 10.14). This demonstrates that well-made, "complex tokens" are present as an element of the clay objects assemblage of some sites from their initial appearance in the archaeological record, in opposition to the findings of Schmandt-Besserat (and her subsequent "simple token" = Neolithic and "complex token" = 4th millennium BC onwards interpretation of the evidence. 1996: 16-17, 1992a: 36, 37, 49). Similar decorative elements are reflected in clay figurines at many sites (including Sarab, Gilgal I and Sha'ar Hagolan, see figures 10.15 to 10.17). Equally, there is an absence of clay objects at sites with these same characteristics (Appendix J), suggesting "tokens" were not an essential part of the "Neolithic Package".

Where available, the contextual distribution of clay objects is also diverse (see individual objects entries in Appendix A for full details). At Höyücek, they are exclusively restricted to one particular phase of settlement whilst the clay objects of Çayönü are found only in "domestic occupation areas", and are completely absent from the site's ritual or special function buildings (see Chapter 9.4b). At Hajji Firuz Tepe, geometric clay objects, figurines and sealings are found in contemporary stratigraphic levels, yet have very different distributions; sealings in large caches of alike-objects (usually externally), figurines scattered inside and in-between houses, whilst geometric clay objects tend to be found inside domestic buildings (Chapter 9.4b, table 9.16 and Appendix A). This small glimpse into the context of clay objects across a variety of sites in the Neolithic Near East suggests different social practices may explain the differential presence and distribution of clay objects across the region.

-Sites Lacking Clay Objects

Though difficult to assess if an absence of clay objects is due to a lack of retrieval, identification or publication (all features assessed in Appendix J); of the 56 tier 3 sites, around half report the presence of at least one clay object at the site, yet there are also a number of sites where small geometrics are almost definitely absent. These are sites

where small objects were sought and recovered from excavations, where the excavation techniques were sufficient to enable the recovery of such items (those that employed systematic sieving and/or flotation of a sizeable proportion of their sediment); also sites where there is no reference to potential small, geometric clay objects in the published literature or where their absence been confirmed either by the project director in direct communication or in a publication related to the site in question.

The real absence of clay objects cannot be guaranteed for the majority of sites, yet can be verified at some. The complete absence of clay objects can be claimed for the following sites: Musular, Pınarbaşı, Erbada and probably Hacilar (Anatolia), al-Basatîn, Wadi Shuʿeib and most of the Wadi Ziqlab project sites (South Levant) and Shir (North Levant). In addition, a few sites are claimed to have only a very small number of clay objects (generally two or three possible candidates). Those confirmed as such by recent correspondence with the excavators are: Ba'ja, described as containing "almost none in contrast to Basta which has several" (Hans Gebel pers. comm.), one single stone is the only possible "token" from the Wadi Ziqlab project sites (K. Gibbs and T. Banning pers. comm.), "less than 5" from Yiftahel (Y. Garfinkel pers. comm.), "just 2 or 3" from Wadi Faynan 16 (B. Finlayson pers. comm.) and a very small number of possible candidates for Domuztepe (S. Campbell pers. comm.). In these cases the absence of clay objects is intriguing and may point to a larger, unknown, number of Neolithic sites with a definite absence of clay objects. In this instance, it is useful to consider the site and its characteristics, especially which, if any features or activities that may be related to clay object use, are present or absent in order to further support or dismiss the possible functional interpretations of clay objects as well as Schmandt-Besserat's theory and others.

No obvious characteristics link these clay object-lacking sites together. All have sites with significant numbers of clay objects in close proximity. Some, such as the 20 hectare, 6th millennium (c. 5,700-5,400 cal. BC) site of Domuztepe, Upper Mesopotamia (Carter, Campbell & Gauld 2003: 118) and 7th millennium (c. 7,000-6,000 cal. BC) Shir (Bartl & Ramadan 2008: 64, Bartl pers. comm.) lack clay objects, yet do have objects from the artefact categories most commonly associated with them; stamp seals and sealings. To date, Domuztepe has yielded 143 stamp seals and 13 seal impressions in clay (Campbell *et al.* 1999: 396, 417; Carter, Campbell & Gauld 2003: 122, 130, 131-32, figure 20 p. 131; Denham 2013: table 4-14 p. 109, p. 234, fig. 6-18 p. 235). Shir has no

seal impressions, yet approximately 19 stone stamp seals have been excavated (Bartl pers. comm.). Domuztepe has abundant evidence of communal and ritual activity, as well as complexity as evidenced in a number of spheres; skilled craft production, the redistribution of finished goods and raw materials and a developed subsistence economy (domesticated sheep, goat, cattle and pig, along with the usual cereals and legumes)- possibly including the use of secondary products (milk and wool). Complexity is also apparent in the scale of Domuztepe, and its spatial organisation, including its terraces; interpreted as boundaries to control relationships between individuals and groups (Carter, Campbell & Gauld 2003: 118-19, 120-28, 130, 132; Campbell *et al.* 1999: 396, 403, 416-17). In this context, an absence of clay objects is notable, certainly demonstrating they were not essential at a large, economically diverse, Late Neolithic settlement (though it is a possibility that the abundant, reused pot-sherd discs or "jetons" were used in place of clay objects here).

The evidence from Shir reveals a small, agricultural community of 300- to 500 people, with a well-developed pottery and craft industry. Ideally located in a fertile agricultural area, on a 30m high natural terrace above the Sarut River (a tributary of the Orontes), the site had year round water from these rivers, plus surrounding wadis and springs (Bartl & Ramadan 2008: 63). A range of environments, proving home to varied plant and animal species were within immediate reach of the site. With such a lush environment, the villagers may have had little need for exchange as most needed resources needed for subsistence and crafts (including a range of stone and clay) can be found at or close to the site (Bartl & Ramadan 2008: 63). Cereals (hulled barley, emmer wheat and einkorn) and legumes (predominantly lentils and some pea) were the staple plant foods, with wild fruit (fig and pistachio) also exploited to a lesser degree. Though small, at 4 ha., the community did employ storage; both small scale within domestic buildings (as seen in small silos within living spaces) and large scale in the form of purpose built storage complexes, within large buildings (figure 10.18). The site's stamp seals date to all occupation levels and areas of excavation, though notably not in or near the storage complex (pers. comm.). The seals are all of local stone, found in three contrasting colours: black, white and pink; and are incised with an array of geometric designs. The seals are also diverse in size and shape, and overall, are extremely well crafted, decorative items. No two stamp seals or nor stamp designs (including design, outline shape and size) are identical, and the vivid colours of the stamp seals adds another dimension to their appearance. The diversity of seals and their impressions, combined with the lack of sealings, has led the excavator to suggest the rather than

acting as traditionally interpreted (to leave a mark or impression on wet clay) seals at Shir were purely decorative items; perhaps identity markers, worn on the body as a sign of display (pers. comm.).

Pınarbaşı is a site close to Boncuklu Höyük, located c. 31 km to it's southeast. Occupied from the mid-9th millennium BC cal., its later 9th millennium phases are contemporary with Boncuklu's earliest phases (Chapter 4.1, also Baird 2012a: 182, 192; Watkins 1996: 52). Given that it is a site proximate to Boncuklu, occupied by a group engaged in foraging, with no evidence of farming or herding related activity, it is interesting to examine the question of geometric clay object presence or absence. No clay objects were recovered from the 9th millennium BC phases at Pınarbaşı (Baird pers. comm.). The only possible comparable object was a small flat limestone disc of similar size to some clay objects, although this is equally or indeed more likely to be a bead blank (Baird pers. comm.). Similar retrieval practices operated at Pınarbaşı, and the two sites were excavated by the same director (see Chapter 4.1) so this is a truly stark contrast. It seems likely therefore, that the absence of clay objects at Pınarbaşı, and their presence in abundance at Boncuklu Höyük, relates either to the far greater degree of sedentary behaviours present at the latter, to Boncuklu's use of domestic plants, or the increased ritual and symbolic expression evidenced at Boncuklu Höyük (see Chapter 4.1). Pınarbaşı's second phase of occupation sits in the second half of the 7th millennium, roughly contemporary to Mellaart levels IV-I at Çatalhöyük's (see figure 9.1, table 4.2-2 and Chapter 4.2) and also settlement at Can Hasan I, 35 km to the southeast of Pinarbasi (figure 4.1-2)-(Baird 2012a: 183. 203-04, Watkins 1996: 52). This later, 7th millennium archaeological activity at Pınarbaşı likely reflects the actions of a task group from either of the nearby sites (Can Hasan I or Çatalhöyük); or an independent, mobile, herder-hunter community (perhaps more than one)-whose transient lifestyle co-existed with the sedentary village communities of the Konya plain (Baird 2012a: 203-04). Either scenario could explain the absence of clay objects within the archaeological assemblage of 7th millennium Pınarbaşı; either they were used and kept at the main site, or the users of Pınarbaşı as a temporary camp-didn't not entertain a lifestyle necessitating the use of clay objects.

The central Anatolian site of Aşıklı Höyük, located c. 150 km from Boncuklu Höyük (25 km south east of modern Aksaray) is another interesting and contrasting site. Settled slightly earlier than Boncuklu and with some phases of occupation overlapping at both sites, Aşıklı Höyük has only a handful of clay objects, mainly in the form of cones (Esin,

et al. 1991: 134, pl. 10; Özbaşaran pers. comm.). This is unexpected given the proximity of the sites to each other, their contemporary nature and the fact that in the contemporary phases (levels 2 and 3) Aşıklı is significantly larger than Boncuklu at 3.5 to 4 hectares (Esin, *et al.* 1991: 126). At this period, Aşıklı Höyük had a structured layout consisting of rectangular buildings tightly packed together, accessed via the roof, due to the proximity of one building to another, separated by only narrow passages and alleyways (Düring 2007; Esin, *et al.* 1991: 136-45). Planning is seen not only in the buildings, but in the form of a large, wide street or "ceremonial way". In addition, an array of highly crafted finished goods and imported raw materials are present on site, along with a significant element of probably herded but morphologically wild, sheep (Düring 2007; Esin *et al.* 1991: 124, 132-53; Stiner *et al.* 2014; Todd 1966). Therefore, Aşıklı Höyük has many characteristics similar to Boncuklu. If geometric objects were frequently used for counting purposes at Boncuklu it is intriguing they are less well represented at Aşıklı Höyük. At Boncuklu Höyük, many clay objects were retrieved from wet sieving and flotation (as detailed in Chapter 4.1), which were employed sporadically in the original excavations at Aşıklı by Esin. Retrieval practices at the current, on-going Aşıklı Höyük excavations led by Özbaşaran, including into earlier levels more directly contemporary with Boncuklu, are more comparable with Boncuklu techniques and it will be interesting to see if in the future, geometric clay and stone objects are actually more frequent than the published evidence suggests.

One final consideration for the sites which apparently lack small clay objects is the issue of object terminology and artefact classification (as discussed in Chapter 5). Aside from the *clay objects* (small pieces of clay being crafted into a geometric shape) of this study, similar items of organic material may have been used to perform the same function, perhaps even operating side by side with their clay counterparts. Cylindrical rods made from snapped twigs, spherical pellets of animal dung, spherical and ovoid-shaped nuts and seeds for example, are all potential organic tools, to be used alongside or instead of clay objects. Yet they would leave little or no trace archaeologically. Objects crafted from re-used pot sherds ("jetons") were not included in this study. Indeed, aside from the work of Costello (2000, 2002), no such artefacts were mentioned in all reviewed literature. However, the presence of such objects was noted during data collection at Çatalhöyük (a very small number of c. 1.00 cm to 2.00 cm diameter, unpierced discs are to be found amongst the hundreds of bags of pottery from the site's Neolithic levels) and Tell Sabi Abyad (far larger numbers and larger, mostly pierced items. See Chapter 5.5b). Hundreds of small disc-shaped objects made

from reused pot sherds have been found across sites of the Late Neolithic in the Near East, including a few hundred at Domuztepe. At sites where clay objects are apparently absent or found only in extremely low quantities, their absence may perhaps be explained by the alternative use of pot-sherd discs, seeds, dung, wood or items of other organic materials.

Evidence from the tier 2 and 3 sites highlights the assortment of Neolithic settlements which contain and do not contain clay objects, as well as the diversity of contexts clay objects are found at, when present. Some sites see the apparent concentration or exclusive presence of clay objects in particular phases only (phase D at Hajji Firuz Tepe and the Sanctuaries Phase at Höyücek for example), in areas of a specific character (only within domestic areas of Çayönü) or the equally telling absence of clay objects in certain context types (the ritual or "special purpose" buildings of Çayönü). The tier 2 sites also have informative artefact distribution patterning; the segregated deposition of geometric clay objects, clay sealings and figurines at Hajji Firuz Tepe for example, supports a non-administrative, non-ritual function of clay objects. In contrast, the disposal of clay objects together with figurines at Höyücek supports a ritual interpretation of their use here, and the distribution of clay objects, sealings and stamp seals in a single, burnt building at Arpachiyah suggests an administrative role, yet the contextual deposition of the objects within the building (whether in discrete caches of "tokens", seals and sealings for example, indicating an archive) remains unknown (Campbell 2000: 4). The diverse nature of the evidence supports the multi-functional interpretation of clay objects within the Neolithic of the Near East, with clay objects taking on different roles at different sites, and possible different roles within a single phase of settlement of a single site.

10.4- ASSESSMENT OF POSSIBLE FUNCTIONS OF SMALL GEOMETRIC CLAY OBJECTS

10.4(a) COUNTING AIDS

One of the simplest functions for small, geometric clay and stone objects proposed is their use in counting. A distinction must be made here between pure counting and recording or accounting: the latter distinguished by the use of the objects to retain information, to be retrieved at a later stage in the future. Yet still, there are various

ways in which it can be imagined, that small objects could aid in the pure counting process.

(i) Clay objects could be used in simple one-to-one correspondence to count a number of individual items or sets of items. A clay object would be moved from one place to another, counted side by side with each item. This could be advantageous if large numbers of items were being counted. The use of clay objects as counting aids could prevent people from losing count, which could easily happen, especially when performing large counts, undertaking counting in a busy or chaotic situation, and if there was a delay, however small, in the completion of a count. One-to-one counting with clay objects would also serve to increase the accuracy of counts and such a system would also enable people with limited numeracy skills to perform simple counting tasks with ease. Number words, counting aloud or in the head would be unnecessary, simply a clay object could be moved from a bag to a surface, along with each object counted. At the end, the new pile created would visually represent the number of items or units that had been counted.

Additionally, if, as the absence of abstract number in the earliest written records of south Mesopotamia for the first 1,000 years of writing (until the end of the 3rd millennium cal. BC. See Chapter 2) can be taken as evidence of the lack of a concept of abstract number, and a lack of number words in 4th and 3rd millennium cal. BC Mesopotamian society, then abstract counting would be difficult. This is not to say that Neolithic communities lacked the cognitive ability of abstract counting and had no number words; however the use of clay objects to aid counting in a one-to-one method makes the question of whether nor not these early village communities had the ability to conceive of abstract number irrelevant.

(ii) Adding to the complexity of counting involves using the position of "counters" on a board or abacus for example, as indicators of values (as described by Netz in Chapter 2.4a). The position of clay objects (or other items) on a board or abacus could indicate further meaning; to change the value of a single "counter" from a single to multiple unit (from 1 to 10 to 100 for example in the metric system, or from 1 to 6 to 60 in the sexigesimal system of the earliest written records from south Mesopotamia).

(iii) Finally, as suggested by Schmandt-Besserat (see Chapter 2.4a), "counters" may be selected for alike-qualities. A single, given point in time where the counting of more than one item was needed, objects of a similar appearance could be used to count one specific item and counters of a different colour, size or shape for example used to count a second. This would prevent errors in the overlap of counts, or if the counters were accidently mixed.

If it is to be argued that small geometric clay objects were used to count, then exactly what could have been counted needs to be considered. Early agricultural communities certainly would have had the need to count many things. People, livestock, wild game (fish, birds, amphibians and mammals) animal catches; agricultural produce, processed and cooked foods and raw materials. The Neolithic was a time of increasing diversification of labour and specialisms. Therefore it is likely villagers would have had the need to assess productivity and output: the number of tools made per day, the units of grain ground in a given session or the number of portions of meat resulting from the butchery of the days catch for example. In addition, it is likely farmers would have had the need to keep track (via counting) of days, months and longer periods of time, for agricultural reasons, along with religious, ritual and other purposes; for example; the number of days from one event to another (such as from a person's death to their burial, the number of days between departure and return of a group of villagers sent to gather obsidian or from the planting to the harvesting of a cereal crop).

Certainly the assemblages of small, geometric clay and stone objects assessed in the chapters above could have been used to aid simple counting. As a wide variety of people, animals and commodities might have been counted, the context of the clay objects within sites of the Neolithic would not be informative with regards to their exact counting function. They may be left scattered in fields, buildings or swept into midden areas as it would be likely they were disposed of after being used – or kept to be reused for a further count. Therefore single clay objects, broad clay object scatters or caches of clay objects in a variety of find spots, are all likely scenarios for the disposition of these objects if used in simple counting. The contextual evidence from Boncuklu Höyük and Çatalhöyük largely supports the simple counting theory. At these sites, clay objects are found in a variety of locations, most commonly in middens, either alone or with general refuse. This suggests the use of clay objects in generalised activities associated with most households of Boncuklu and Çatalhöyük. The absence of

comparative clay objects at Pınarbası is telling, suggesting clay objects were utilised in activities associated with farming or crops. Boncuklu Höyük and Çatalhöyük also have strong evidence of far more elaborate symbolism and intense ritual activities in comparison to Pınarbası. This sphere of household activity therefore also remains a strong contender for the role of clay objects at Boncuklu Höyük and Çatalhöyük.

The appearance of the studied clay objects is not as convincing in support the "pure counting" interpretation outlined above. Within a single site, small geometric clay (and stone) objects are present in a variety of shapes, many of which bear impressions and decorative markings. This makes the simple counting theory appear too simplistic a proposition. The work of Netz (2002, Chapter 2.4a), Herskovits (1932, Chapter 2.4a) and others, clearly demonstrates the capacity of simple, small, identical objects to perform advanced calculations. This prompts the question as to why people in the Neolithic would people take the extra time and effort in creating objects of diverse appearance, if the appearance of such objects were inconsequential? Perhaps clay objects were shaped and decorated purely for aesthetic purposes? They were after all, very quickly and easily made. Alternatively, as suggested in scenario iii) above, the differing characteristics were used as a way of distinguishing counts of one item from another – with objects given meaning at a single place in time, the meaning lost once the count had been made; yet providing the ability to simultaneously count different things side by side.

10.4(b) RECORDING DEVICES

When considering what could have be *recorded*, we are presented with the same set of variables as for the counting scenario. As seen above, a plethora of things including people, animals, agricultural produce, gathered and processed food stuffs, as well as raw materials and finished goods were in circulation. Therefore Neolithic villagers had all manner of things to both count and record, and the complexity of settlements likely necessitated the need to count and record such things. How ancient record keeping might have functioned in practice is a far more complex issue. As seen by the examples in Chapter 2, apparently simple tools such as; sets of pebbles, tiny balls, pieces of knotted string and notched pieces of wood can be used to record and retain complex numerical and conceptual information. Likewise, the cognitive evolution of humans had, by the start of the Neolithic period, reached a critical stage by which we had acquired the ability to, and began using material culture in the same way as language,

to express and store information (Chapter 2.4a-iv. Watkins 2004: 105; Watkins 2006b: 22; Watkins 2010: 631).

(i) Simple Records

The simplest form of record keeping is a continuation of counting. With small clay objects used to count items (or units of) in one-to-one correspondence, the resultant pile of "counters" may be kept together and retained as a record of the count. This may be useful if, for example, it is expected that the count may need to be checked or verified at a later stage. Practically speaking, it can be imagined that the owner of 20 sheep retains a bag of 20 geometrics as a record of the count (representing the number) of all sheep owned. If one dies, becomes lost or is slaughtered, one clay object could be removed from the bag. In this way, the owner easily retains a record of his livestock. This is a simple system, and one in which the appearance of the clay objects is irrelevant. They do not need to be identical, nor distinct from one another, as they do not represent "sheep" as mnemonic devices. They simply need to be secured together as a set (in a bag, basket or even a pile in the corner of a room). This system would be useful to a keep record of a person or group's property (unit of grain in storage, rations of meat expected, or received), the number of people out working in a field, the number of days from one event to another and so on. A similar system could be useful in order to keep track of the movement of items or animals from one person to another.

The capacity of the recording system above can be increased quite easily and efficiently. A person or group could create an archive of information by retaining multiple bags or baskets of clay objects in one place. By remembering the relative position of each set of clay objects and the information they store means multiple sets of clay objects, each retaining information related to different items, commodities or activities, could be held. As seen by the example of the system operated by the king of the Kingdom of Dahomey, West Africa (Chapter 2.4b) (Herskovits 1932), multiple sets of clay objects, stored on a shelf in a row could easily be assigned as representing quantities of specific things: the number of children born in a given year for example. This could be transferred to units of grain harvested by season, the number of lambs to a livestock owner per year or even lambs by year of birth on the top shelf, the number of cows by year of birth on the middle shelf and the number of goats by year of birth on the bottom shelf. Thus a complex and practical record of livestock could be kept in a simple way, using clay objects of no particular shape, size or appearance. The application of such a system, in the increasingly large and multi-faceted villages of the

Neolithic Near East, can easily be imagined. Archaeologically this system would leave, at its most simple operation, a group of identical or random clay objects together. A more complex operation would leave many groups of clay objects, perhaps even entire rooms or purpose built small archive rooms full of piles of clay objects, representing records of counts. Associated storage facilities may be expected, yet are not necessary. As explained above, all manner of things may be recorded in this system and groups of people or animals for example would not be need to be stored in purpose built silos.

(ii) Complex Recording

The sophistication of recording system (i) above could easily be enhanced by a simple adjustment of the system. The clay objects utilised, could be formed into specific shapes, sizes, given identifying markings, or made from specific clay colours in order to distinguish them from one another. These differences in appearance could then be utilised, with individual or sets of clay objects grouped by identifying feature, being used to represent different things. In a large count, it may be useful to have larger units represented by a single clay object. For example, to record a count of "425", 25 identical clay objects could be used to represent the "25", and a second set of 4 identical (yet distinct from the first set of clay objects) could represent the "400"-symbolising 100 units each.

Likewise, to create a single record involving multiple kinds of goods, single or sets of clay objects of varying appearance could be used to represent different things. If a person had received two sheep, five sacks of grain and seven pieces of raw obsidian for example, and wanted to keep a record of this, they may choose to store (i.e. in the leather pouch) two spheres, five cones and seven discs (the three shapes each representing the three variables). Like recording system (i) above, the complexity of Neolithic village life may easily have necessitated such a system of administration, with distinctions in the appearance of geometrics used to represent either different numbers, units or commodities. Archaeologically, the evidence left would be very similar to that of system (i), yet a more diverse range of clay objects (in terms of their appearance: e.g. shape, size, colours, markings) would be expected, especially within a single cache or context. The degree of standardisation according to appearance would also be expected to be starker.

(iii) Mnemonic Aided Recording

The final way in which ancient book-keeping could be enhanced is by use of clay objects

distinctive in appearance, acting as mnemonic aids. Dictated by shape, size, colour and/or the presence of distinctive markings; clay objects could be used to represent specific numbers, commodities or both, in a more secure system to scenario (ii) above. As Schmandt-Besserat imagines (see Chapter 2.3, 2.4), a sphere could represent "sheep" for example, whilst a cube could be used to represent "barley". Alternatively, a sphere could be used to represent a single unit (of any commodity), whilst a cube is used to represent ten units (of any commodity). At its most complex, both specific commodities, items, animals and people (by age, gender, marital status or skill for example) and quantities of them, with the addition of a line incised onto a cone changing its' meaning a value from that of "one cow" to "five cows". Alternatively, the meaning of a cone could change by size with a small cone representing "one cow" and a large cone "five cows".

The addition of a mnemonic meaning of geometrics would be beneficial, if more than one person was aware of it and remembered the meanings. It might be utilised by two different parties for the duration of a single transaction, perhaps one of a long duration with the rules and meanings of clay objects, by appearance, decided and agreed upon at the start of each meeting. A single system might even be understood within an entire community and used consistently for any records kept within the village for a set period of time; a period of days, an entire agricultural season or even a generation. Archaeologically, the evidence left behind by this third stage of clay object utilisation in record keeping would be no different to stage (ii), as the addition of a standardized mnemonic meaning in the appearance of clay objects would not lead to any physical change in the range of objects present, nor the behaviour of their users. Alternatively, the mnemonic meanings of clay objects may have be transient, being agreed upon for each and every different transaction, yet transcending site boundaries. This could have been the case when people from different communities came together for festivals, harvests, at the gathering point of external resources and raw materials or to exchange products and goods. There are multiple ways in which a mnemonic system might have worked, with meanings retained to be used time and again between two different, commonly meeting and exchanging parties at specific locations.

Lastly, as claimed by Schmandt-Besserat (1996, 1992a), the code of clay object symbolism may have been uniform across all sites and regions within the Near East, from the appearance of clay objects, throughout the Neolithic period and beyond. In contrast to the other scenarios, archaeological traces of this final concept of the use of

clay objects in recording-acting as a universal code system should most definitely be clear. With each aspect of a geometric's form, crucial in their symbolic meaning, a set repertoire of clay objects would be expected to be found at each Neolithic village site. All sites demonstrating the full basic range of domesticated plant and animal species should have the full range of clay objects, whilst those lacking certain domesticates, or even their wild predecessors, should have a corresponding lack in clay object(s) representing those specific commodities. Furthermore, non-residential sites (such as those in interpreted as purely for the gathering of people on ritual occasions) or the base-camps of mobile herder-hunter-gatherer groups should also lack the clay objects deemed as representing agricultural crops and domestic animals accordingly; though the latter may have clay objects representing their livestock, gathered plants, raw materials and finished goods.

Whilst the final proposition above is not supported by any of the archaeological evidence (as presented in Chapters 6 to 9 and Appendices A and J), it is certainly plausible to argue that people living in the Neolithic might have benefited from the existence of a universal, symbolic system; even though in practice it may have proved difficult to maintain. Such a system would also have taken time to emerge and evolve. It is certain through analysis of the archaeological data that in the Early Neolithic no permanent, local, let alone Near Eastern-wide symbolic system, could have been in operation. However, the assignment of a temporary, transient mnemonic meaning to clay objects, changing for each situation, count, or record-keeping period is much more likely. This is supported by Watkins' assessment of the cognitive abilities of people in the Neolithic Near East, and the interpretation of an applied symbolic value stored within objects (Watkins 2012: 24), understood by groups of people, yet likely to have been temporary and transient.

Evidence for the utilisation of clay objects in record keeping is fairly strong. Found in abundance at many early village settlements, there are a great number of sites which display not only the clay objects, but the people, animals, foodstuffs and commodities needed to keep track of. The simultaneous timing of the appearance of settled agricultural villages and small geometrics offer further support to this theory. Exactly how clay objects could have been used in Neolithic book-keeping is less certain, but it seems likely that multiple methods were in operation at any given time –perhaps even within a single site.

-Tell Sabi Abyad

Tell Sabi Abyad provides the strongest evidence for the use of clay objects in the recording sphere. Their distribution, being found concentrated in caches inside particular rooms of certain buildings within some areas and levels of the settlement (operation II and level 6 of operation I), suggests that at least within some of the communities of Tell Sabi Abyad, small geometric clay objects were used not just to count goods, but to retain information related to their storage. This idea, inspired by Schmandt-Besserat's (1992, 1996) work has been published (Akkermans & Duistermaat 1996; Verhoeven 1999). However, it is not argued here that a dual community of permanent residents and visiting nomads existed, nor that they used a system of seals, sealings and clay objects to secure, account for and record their stored goods.

Schmandt-Besserat's ideas aside, it could be argued that a recording system capable of holding such complex information would only be necessitated at a large site, where private ownership was in operation and various people or groups of people were storing, trading and exchanging a wide range of goods on a regular basis. Tell Sabi Abyad has evidence for such a complex community in some phases and areas of settlement, with a diverse array of raw materials, finished goods, plant and animal species and the presence of specific store-rooms and even or entire storage buildings present, in addition to domestic architecture (Chapter 4.3). The widespread use of a huge range of stamp seals in sealing practices at the site also attests to the level of complexity in storage at the level 6 village of operation I at least (likely also for operation II). Tell Sabi Abyad also exhibits a wide variety of clay object shapes and a correspondingly high level of finish for many of its clay objects, a significant proportion of which display the addition of decorative markings (Chapter 8.2, table 8.13). Lastly, the context of Tell Sabi Abyad's clay objects, where far fewer are recovered in midden or refuge contexts (compared to Boncuklu Höyük and Çatalhöyük) and a large number are recovered from the fill of buildings; many of which came from artefact clusters incorporating other clay objects. This strongly points to the existence of a complex accounting system being in operation within some phases and villages of Tell Sabi Abyad. This system clearly exceeds basic counting. The diversity of shape, along with the level of finish, and degree of standardisation seen within the assemblage (the anthropomorphic cones, the large impressed discs and the miniature vessels for example) point to the use of groups of clay objects united by a specific visual attribute being used to symbolise certain numbers, objects, commodities or both.

-Çatalhöyük

Incorporating additional evidence in the form of on and off-site activities, there are many actions and commodities for which people may have needed to count and keep a record of at Çatalhöyük. The sheer range of acquired raw materials found on-site, the range of plant foods in both raw and processed form, as well as the movement of people from off-site to herd animals and tend fields, to enter or leave the site permanently to marry and the movement of livestock from one location to another are all activities which may have been recorded or at least counted at regular intervals. In this case, people and live animals, not just goods and commodities, are important. This combined with contextual evidence from Çatalhöyük offers reasonably strong support for the use of at least some of the site's small geometrics in the accounting sphere. The presence of two objects found within separate storage areas further enhances the accounting scenario (i.e. CO# 333 table 7.12). These represent a tiny fraction of the Çatalhöyük assemblage, yet with the bulk of the site's clay objects coming from midden contexts, this deposition location demonstrates that, for most clay objects, the original use-context is unknown.

The distribution of geometric clay objects within the households at Çatalhöyük remains an open question. Only a relatively small proportion are found within secure building contexts (such as room or building fill). The majority of Çatalhöyük's clay objects come from middens and this large proportion of midden objects makes it difficult to quantify the number of households that may have used clay objects. Middens represent material from the interior of houses in the form of hearth rake-out and floor sweepings (Shilito 2010: 139), yet as a refuse area, midden material also contains waste discarded from other sources. The number of midden objects that originally came from inside houses as opposed to other locations is unknown, thus the exact proportion of households that originally did and did not contain clay objects and exactly how they might have been used in recording is unclear. As Çatalhöyük's middens are completely surrounded by houses, almost all midden material must have come from houses, house rooftops and their interior sweepings, representing refuse of household activity. In this sense, practically every Çatalhöyük household, like those of Boncuklu Höyük, must have had at least a small number of clay objects at one point in time.

The diversity of clay objects exhibited, as well as the presence of a small number of intentionally "marked" clay objects and sets of largely homogeneous examples, all

demonstrate that as in recording scenario (ii), small clay objects of various forms could have been used simultaneously to represent specific numerical quantities, commodities or both at Çatalhöyük. However, it does not point to a uniform, site-wide symbolic and mnemonic system being in operation. Within scenario (iii), the differences between objects of different meanings would need to be stark, as would the similarity of objects with the same meaning. A range of sets of identical objects would be necessary and would need to be present in fairly large and even numbers.

Within the studied Çatalhöyük assemblage, not all three-dimensional shape categories are overtly and immediately uniform, and many are represented in only very small proportions. Just three sets of objects fulfil the criteria: the mini balls, the squat, cylindrical-shaped objects and a selection of cones. These sets of objects provide the ability to symbolise and thus record three types of commodities: spheres to represent grain, squat cylinders to represent sheep and cones to represent cattle for example. This count could be increased if other less cohesive, yet still distinct object forms such as cones and discs, were included. If certain shaped objects (interchangeable in symbolism or static) represented certain goods or commodities at Çatalhöyük, then the site's "figurines" may also have been involved in this system. Why use a sphere to represent a sheep when many figurines of sheep and cattle are present on site? Similarly, some of the anthropomorphic figurines-at least the more easily rendered abbreviated forms-may have been used to count or record humans as part of their multi-functional nature. As seen in Appendix D, the context of zoomorphic figurines and the studied geometric clay objects is similar, as is their temporal distribution. Yet there is no further evidence to suggest figurines and clay objects functioned in the same way at Çatalhöyük.

The "mini balls" from Çatalhöyük help illuminate the picture. Many of these were found inside buildings *in situ*, most in large clusters of identical objects (Chapter 7.5 and Appendix D, especially figure A.D-3 and tables A.D-1, A.D-2 and A.D-4). This caching of large numbers of small geometric items strongly resembles the indicators required to support the scenario of the use of geometrics as non-symbolic, non-mnemonic accounting tools-representing a count, with perhaps their location additionally symbolising what the count records or when it was taken (i.e. scenario (i) "Simple Records" above). The fact that the "mini balls" are generally cached together in large quantities, and without objects of a different appearance, strongly points to their exclusive function. Their intentionally heterogeneous appearance, contrasting with the

wider diversity of small spheres within the small geometric object assemblage at Çatalhöyük (which also includes a number of small stone spheres, (Chapter 7.5 and Appendix D) is striking.

Why cache only objects of a particular appearance, especially of similar items of a different form were in circulation? Rather than supporting recording scenario (ii) above, the intentionally identical nature of the cached "mini balls" shows that their appearance was indeed important. If not, a randomly sized, coloured and finished selection of spheres would instead have be cached. Therefore it seems likely that there was symbolic meaning in the appearance of these "mini balls", though whether this was understood by anyone aside from the person or group of people who cached them is debatable. Likewise, seemingly similar caches of identical "mini balls", sealed under the floors of different buildings, may have held a different symbolic meaning in each instance. The absence of similar caches containing a more diverse range of geometric forms however, brings this theory into question. In addition, the huge number of mini-balls (the total estimated number as well as the recorded sample) and their distinctive context, in comparison to other geometrics recorded from the site, suggests either a different function for them or that the other geometric objects operated outside of the recording sphere.

-Boncuklu Höyük

There is little evidence for the functioning of Boncuklu Höyük's clay objects in a site-wide mnemonic system, as sets of distinct and immediately recognisable types are not evidenced in the large assemblage of this small site. For a mnemonic system to be effective, clay objects would have needed to be clearly differentiated from each other by a combination of standard features or a range of these. But here, the degree of standardisation is lacking. It is however, possible that Boncuklu's clay objects might have been used as a very simple record of transactions on an ad-hoc basis, in a fluid manner, essentially in a face to face mode. The appearance of the objects may have been unimportant, as in scenario (i). Alternatively, two parties of a counting, exchange or administration event could have assigned a single, or set of geometrics an ad-hoc significance (i.e. if two items were to be exchanged, then two clay objects would be given as a guarantee, ten clay objects for ten items and so on) with no standard correlation between form and goods. If transactions were being carried out on a small scale, face to face, with the same two people or sets of people meeting twice, first to agree verbally on the terms of the transaction, they could decide on the meaning of the

objects utilised and then present the same items again in order to finish the exchange. Therefore, three clay objects (of any form, similar or dissimilar) could represent the transaction of two animals and one bag of plant products, for example, with the presence of three clay objects, not their size, shape or other characteristics of appearance the important factor. This system may then have evolved into the more complex symbolic system, as suggested by Schmandt-Besserat.

The range and diversity in terms of both the type of site (e.g. size, location, time period subsistence strategies, diversity of imported raw materials) and also the nature of the clay object assemblage (when present) at Neolithic sites containing small geometric objects is huge. One clear contrast is the abundance of clay objects at Boncuklu Höyük, and their complete absence (real rather than due to differing excavation strategies or retrieval practices) at contemporary and proximate Pınarbası. Here, the differences in subsistence strategies and on-site activities between the two sites indicates a number of strong possibilities for the sphere in which clay objects were used. Most telling is the far more sedentary nature of Boncuklu Höyük, its use of cultivated crops, and the marked increase in symbolic behaviour.

The variety of ways it can be imagined that small objects (identical or distinct) might aid in counting and recording, as well as the multitude of things within an agricultural village needing to be counted and accounted for, almost certainly proves that a single, uniform system is inconceivable. This is true even-within a single time frame and locality – let alone the entire span of space and time of the Neolithic Near East. It is equally as unlikely that such a system could be retained for a further 4,000 years after the end of the Neolithic which then developed into the writing system that emerged in the late 4th millennium BC of South Mesopotamia. The sheer complexity of cuneiform numerical notation; where multiple sets of symbols were used in the notation of numbers, according to what was being counted (within a single site and time period) attests to this view (figure 2.5) (Woods 2010: 40).

10.4(c) GAMING PIECES

The use of small, geometric shaped objects in gaming at some sites, is a strong possibility. Gaming is generally a leisure activity and comes in many forms, thus easily explaining the diversity in assemblage form, counts, the diversity across sites and the absence of clay objects at some sites in the Neolithic. It is likely that in preceding time periods, peoples of the Near East were also engaged in gaming. The start of the

Neolithic period, with the settling of people into permanent villages and the abundance of clay at the majority of locations, it can be argued that the sudden increase in clay artefacts of a number of forms (figurines, geometrics and later pottery) came about as a consequence. The diversity in clay object forms is similarly reflected in many aspects of Neolithic material culture, in the diversity seen in the style of female figurines of the Neolithic Near East, for example.

Gaming is a universal past time, evidenced all over the world, from ancient times into the present day. Many shapes represented by clay objects would have worked as gaming pieces; spheres and cones seem particularly suitable, the former being rolled, or used on a board with depressions, cones easily picked up from a flat surface and moved from one position to another. As evidenced in Chapter 2.3b, the exact mechanics of the game; the rules and also the number of players, the use of and type of board, number of counters used for example, would not necessarily affect the shape of the counters. Some games may be better suited to counters easily picked up from a flat surface between the thumb and index finger (such as a cone or cube), others may favour more flat-shaped pieces (discs) or be played with rounded pieces on a board with depressions. Size is a more important factor in determining the appearance of playing pieces. Even across the diverse range of board games on the market in the world today, gaming pieces all remain within a small size range; of around 2-5 cm. Gaming pieces generally need to be small enough to be picked up between the fingers, for a number to be held simultaneously in one cupped hand and for a modest number to be fitted onto a gaming board or table at a single time.

The diversity seen within clay object assemblages at the case-study sites and between assemblages of objects across Neolithic settlements does not therefore exclude the possibly of the small geometric objects having been used as gaming pieces. A gaming piece has no set style or form. As evidenced in Chapter 2.3b, gaming pieces, even within a single game and a single culture, exist in a huge variety of shapes, raw materials and degrees of refinement and decorative elaboration (figures 2.14, 2.15, 2.17-21, 2.23-2.25, 2.29 & 2.30). This acts as strong support for the functioning of the studied so-called clay objects of the Neolithic Near East as gaming pieces. Diversity in the appearance of clay objects within a single site could represent different teams in gaming, with multiple types of games represented at a single site. For example, in a game such as Draughts where only two variables are needed, one person could play with spheres, another with discs; likewise, all of the blackened or dark coloured objects

could be used against the lighter objects. In other games, only one variable is needed, thus objects of a similar size would be the only requirement. Different games could be represented by the variety of major object shapes and there might well be some dynamism in game playing. Aside from being used on a contoured board, spherical-shapes could have been used like marbles, whilst the shape of cones, cylindrical objects and pawn-shaped pieces are better suited to being picked up and moved around a flat playing surface.

Further support for gaming comes in the fact that where present, clay objects tend to be found in significant quantities, rarely are only one or two clay objects present at a single site. Evidence for Neolithic gaming boards is more elusive (see gaming discussion in Chapter 2.3b). Probable boards are found at some sites, yet this is not a definitive interpretation. For example, Ain Ghazal has at least one likely gaming board (see figure 2.10 and Chapter 9.3), as do Beidha and Shir, where two boards have been excavated at each site (figures 2.8 and 2.12). 'Ain Ghazal and Beidha have also yielded number of clay objects which might have been played on these boards. Yet Shir has none (Appendix J) bringing the "gaming board" interpretation of the notched stone slabs into question. Yet simple or in fact very ornate playing pieces may have been made from organic materials: wood, or textile/plant material for example.

Though the examples of sites with stone "gaming boards" with depressions into which the small geometrics would fit at first seems to support the notion of clay objects as gaming pieces, its seems strange to exert considerable effort into carving lines and depressions into a stone slab (figure 2.12), yet not exert a far lesser degree of time and energy into creating simple geometric-shaped playing pieces of clay. The absence of clay objects at Shir casts doubt on the functioning of the stone boards as gaming tools. In addition, the possibility of boards being most commonly made from organic materials or simply marked onto the ground is not supported by any of the case-study sites. Çatalhöyük is an especially well preserved (with respect to organic materials) and meticulously excavated site. Its buildings are full of plastered floors and walls, adorned with paintings and plaster installations (Chapter 4.2). The floors and walls of many buildings have been painstakingly removed layer by layer, revealing changing designs of the paintings. Yet no trace of any painted, incised or applied (with plaster to the ground) gaming boards have been recovered. Excavations at Boncuklu Höyük have similarly revealed and removed layers of plastered floors (Chapter 4.1). They are found both inside buildings and on open air work platforms, each layer measuring just a

fraction of a millimetre. Again no hint of any gaming boards or similar markings have been found on any floor surfaces at Boncuklu Höyük. The current evidence lessens the attractiveness of gaming and certainly board-based gaming as the primary function of clay objects at the case-study sites. Clay objects likely had an alternative function to gaming at Boncuklu, Çatalhöyük and Tell Sabi Abyad; though gaming remains an option for many other Neolithic sites in the Near East.

10.4(d) RITUAL, DIVINATION & LOTS

The use of small geometric clay objects within the sphere of ritual or religion is difficult to prove. Neolithic beliefs were complex, and ritual varied. Though overall, evidence of Neolithic ritual is rich, the evidence which we have relates to only certain elements of ritual practice. Confirmation of activities from many significant spheres of ritual activity: dance, singing, changing, processions, masks, costume, make up and body paint is extremely sparse or absent in the Neolihitc archaeological record. The category of "ritual" is often assigned to items were no other definitive function can be proved. Yet, the Neolithic period in West Asia evidences a surge in ritual activities, and therefore the use of these objects a part of normal magic and ritual activity is not unrealistic.

Though no geometric clay objects are known to have been intentionally placed in a Neolithic burial at present, their placement in a few instances does suggest ritual activity. At Sabi Abyad II, a number of geometrics and clay figurines were found in a ritual deposition: a burnt and ashy area, also dense in human remains (see Chapter 8.3). The building within operation II at Tell Sabi Abyad also contains a large number of clay objects (and four bullae) in a highly ritualised context. In central Anatolia, Höyücek's Sanctuaries Phase (start of the 6th millennium cal. BC) contains many small geometrics in an arguably ritual setting (see Chapter 9.4b) (Duru & Umurtak 2005: 173-77, 197). Çatalhöyük too has at least two examples of clay objects deposited as part of probable ritual caches outside of the mortuary sphere; one (space 432, TP Area) is found within the in-fill of a building (an act itself which can be interpreted as full of ritual symbolism-see Chapter 4.2), deposited along with 26 objects including beads, polished and worked stone artefacts bone artefacts, obsidian tools and a stamp "seal". The other (space 261, South Area) includes various elements of animal bones and other domestic waste materials (including pottery sherds and obsidian waste), personal (beads, clay figurines, pigment stones) and utilitarian artefacts (a horn core, projectile points, a greenstone axe fragment, worked bone points (see table 7.13). Both ritual

contexts are *in situ* depositions which include the placement of a small geometric clay objects in each (CO#s 476 and 410). Furthermore, as mentioned above, the strong evidence of elaborate ritual activity seen at both Boncukllu Höyük and Çatalhöyük, in contrast to the much reduced symbolic and ritual evidence from nearby Pınarbası, and the corresponding lack of clay objects at the latter site, is indirect evidence in support of the use of clay objects in ritual, at least on the Konya plain in the 8th and 7th millennium cal. BC.

More specifically, divination is a possible ritual role for small geometric clay objects, as part of ritual practice (see Chapter 2.5c); used in decision making and to foretell future events. Clay objects could have been used as "lots"; being thrown or drawn from a container, in order to make a choice or decision, the outcome of which may have been dependent on the way the objects fell (for example; the distribution of the objects, or the angle or location of a specific objects within the group). Though there is no direct evidence of this practice, the method is seen commonly throughout history and ethnography. The number, size and variety of appearance of the case-study assemblages certainly suggest the possibility of the use of their clay objects as lots. They are small enough for a few to be placed into a container or cupped in the hand, ready to be tossed or selected by an agent. The newly emerged agricultural communities would certainly be in need of decision making tools and lots may have been useful in making fair, undisputable and unbiased decisions. Many decisions would need to be made related to hunting and animal herding, plant and animal cultivation, the distribution of resources (including meat, cereals, land, and animals) and the distribution of labour roles. "Lots" could have been a way to make difficult decisions, to ease tension and competition, and avoid confrontation between individuals and families within the growing village settlements of the Neolithic period-both at Boncuklu Höyük and at other sites.

An alternative is divination. There are multiple methods of divination, but it can be imagined that like "lots", the small clay objects (individually or as a group) were cast or drawn, with the selection of an object(s) of a particular visual quality. Alternatively, the orientation and relative distribution of a set of geometrics could be interpreted as portraying a message from higher beings-signalling the outcome of a decision. Like the use of clay objects as gaming pieces, their use in divination would not necessitate a group of objects of a specific form. Depending on the method, a set of similar or disparate objects might be needed and if the latter is relevant, distinguishing attributes

may be decided upon at the time of casting; allowing any manner of different types of clay objects to be used in this way. Likewise, divination may take place in a variety of settings.

With the ritual power not held in the objects themselves, but coming from the authority performing the act, or believed to be in control of its outcome, simple, crudely made clay objects could be used for divination. They may be discarded or used for a different purpose once the act had been performed. Divination and gaming are closely linked and in ancient times, gaming may have served a similar function. The winner(s) of a game or tournament could easily be seen as having been chosen by the gods (as in divination) or purely by their skill in gaming. This could award the individual or team the position of a particular social role, access to a specific resource, the best share of a piece of land or portion of meat for example. It may also award them with the authority (divine or otherwise) to make decision with regards to resource distribution, animal or plant management.

The Neolithic of the Near East displays a wealth of ritual evidence, this is seen at practically all sites in the region (some more than others). Göbekli Tepe and Domuztepe for example, all contain a great amount of ritual evidence, outweighing evidence from other spheres of Neolithic life, so why do these sites have an absence of clay objects, or only very small numbers of them? Whilst it seems highly plausible that clay objects were used in ritual activity, the varied and complex nature of ritual dictates that not all sites would have practised the same types of ritual acts, nor in the same way. Perhaps small geometric clay objects were needed in some rituals – and not others, or that their presence was not essential in any particular element of ritual, easily replaced by a set of natural stones or pebbles or even clay figurines. In contrast to the pattern above, the non-residential "ritual" site of Kfar HaHoresh reports an enormous 10,000 clay items (up to 2004 season) including "geometrics, tokens, beads, figurines and large numbers of amorous lumps" (Kuijt pers. comm.).

10.4(e) OTHER EXPLANATIONS

(i) Children's Toys

Additional functions for the use of clay objects are less easily assessed, with definitive evidence for Neolithic toys scarce within the archaeological record. The functional interpretation of any object as a "toy", involves the assumption of the notion of "childhood", as understood in the modern, developed world. This is a notion which is

not universal in the present day. Therefore when considering whether or not the small geometric clay objects of this thesis might have functioned as toys in the Neolithic, they are not assumed as belonging solely within the realm of children's activities. None of the contextual analysis links clay objects to children. Therefore, any such designation of clay objects as recreational play-things would be in relation to them serving as gaming pieces, with children or adults using them as gaming counters or in marble or skittle-type games.

(ii) Weights

The use of at least some clay objects as weights is sometimes offered as a possible use. This may have been either as part of a standardized and set system of units or a more fluid system with each individual object acting as a standard against which to compare commodities. This interpretation however does not seem likely for a number of reasons. Firstly, though the vast majority of clay objects share a similar and limited range of sizes, the actual weight range varies greatly and if a standardized system of weights was in place (not necessarily across the entire Near East, but on a site-by-site basis), it would be expected that the objects would all be of similar or identical weights, covering perhaps three or four different values. In reality, they cover a broad and graduated range of values from 0.05g upwards. If used as weights then a selection of heavier items would also be anticipated. Only a very small number of objects weigh above 4g, and almost none have a mass greater than 20g (see Appendix A).

(iii) Decoration or Adornment

Another potential use of clay objects is as part of a decorative feature. This could be as part of personal adornment (clothing or jewellery), to decorate tools, utilitarian items or buildings, as seen for example in the placing of cones into the walls of Mesopotamian buildings from the Uruk period onwards. Yet this seems highly unlikely in the Neolithic context. Significant sections of plastered floors have been recovered from Boncuklu, Çatalhöyük and many other Neolithic sites in the Near East, and many complete bricks (from walls and floors and platforms at Tell Sabi Abyad) have been studied; none of which evidence intentional and decorative adornment in the form of clay pieces or any other method aside from painting and clay reliefs. Similarly it could be suggested that the objects were used to adorn clothing, perhaps being sewn onto fabric or leather – yet the shape of most would not make this possible. A small number are curved, grooved or pierced (including examples from Tell Arpachiyah-figure 9.27 and Gesher-figure 9.33) which could have made their use in personal adornment possible. Yet, in general, these

items are rather crude in comparison to the incised, decorated and often grooved stones (shaft-straighteners) evidenced at many Neolithic sites, which are often interpreted as markers of personal or group identity and are therefore both utilitarian items and items of adornment. The pierced clay objects are most likely beads and the majority of geometric clay objects do not fulfil the criteria to have realistically been used in personal adornment.

(iv) Sealings: Boncuklu Höyük & Çatalhöyük

Lastly, the possibility that some of the clay objects were used as sealings, bullae and stamp seals needs to be evaluated. The use of clay sealings, most often impressed with stamp seals is well attested at Tell Sabi Abyad (as are stone stamp seals-though in markedly lower quantities, see Chapter 4.3) and contemporary sites in Upper Mesopotamia, Halaf sites). Their use in earlier periods and regions is less well understood. Though not the focus of this this investigation, the identification of sealings at other, earlier sites has important implications. Çatalhöyük has no definitive sealings, though a number of stamps are known from the site (see Chapter 4.2). Boncuklu Höyük has no stamp seals to date, yet n=43 possible sealings; just 5 of which have been identified with a high degree of certainty (table 6.3).

Exactly what sealings sealed or how they were used is unclear as none display clear impressions on the interior surface. The absence of the widespread use of storage bins or units either inside buildings (like those found at Çatalhöyük, see Chapter 4.2. Also see Atalay & Hastorf 2006: esp. fig 4 p. 288 and fig. 6 p. 292; Hodder & Cessford 2004: 20, 22; Fairbairn *et al.* 2007: 477-78) and at other Anatolian Neolithic sites (e.g. Bademağacı levels EN II/4, 3, Hacılar and Höyücek's Shrine Phase, see Chapter 9.4 and figure 9.41; Umurtak 2007: 1, 2, 3, 4, 5 and 7-8), along with an abundance of reed plants (see Chapter 4.1) suggests baskets were the preferred method of storage at the site. Foodstuffs (nuts, grain and legumes) may have been stored in baskets, some of which might have been sealed simply to hold the lid in place securely, when bringing the full basket from the field to the village for instance or simply to keep the contents secure and the basket closed until access was required.

Sealings may also have been applied to prevent unauthorised access or tampering. Although they are simple, made from clay and not stamped or marked in anyway, the presence of a seal could have deterred a passer-by from removing a handful of grain or adding more into his basket from a neighbours, at the point of allocation. Unfortunately

the contextual evidence does little to illuminate the exact use of sealings at Boncuklu. The context of the *possible* sealings is no different to the distribution of Boncuklu's clay objects in general, being found across the various types of context, site areas and phases. However this does suggest that if goods were being sealed on a wider scale, this practice was not restricted to a particular part of the site, time period nor context type. There is no evidence of the restriction of sealed goods neither in an administration complex or area of the site, nor in conjunction with any particular goods or materials.

(v) Stamp Seals & Bullae: Tell Sabi Abyad

The single possible clay stamp seal from Tell Sabi Abyad (CO# 287) is the only identified example from the total of well over 1,000 tier 1 studied artefacts. Though exhibiting a well-formed, clear geometric shape, this semi-sphere also displays a relatively deep incised depression – covering much of the flat base surface (figure 8.35). Like a stone stamp seal, this item would leave a clear impression if pressed onto wet clay. Though the curved upper part of the object is not ideally shaped to be held between the thumb and index finger, stamp seals are known in a huge variety of shapes; including semi-spherical (see figure 3.10). However, almost all display a suspension loop or piercing in order to string the object, making the use of it easier. CO# 287 does display almost all qualities necessary for a stamp seal. Furthermore, its context is fitting-hailing from a site where clay sealings bearing stamp seal impressions are ubiquitous, and stamp seals themselves (in stone) not rare. Though this example is made from clay and has no ability to be strung, the faint, yet visible, opposing and slightly flattened surfaces on the convex part of the shape (see figure 8.35 top) mark exactly where the object would have needed to be held when being used as a stamp. Therefore it is highly likely this object is indeed a clay stamp seal.

Most notable among the Tell Sabi Abyad assemblage are the fragments of four large, hollow spheres; bullae (CO#s 2915-2918, figure 8.17, table 8.6 and figures A.F-9 and A.F-10). Displaying distinct and closely spaced rounded and oval depressions on their interior surfaces, the markings have been interpreted as the impressions left by the "tokens" they contained, caused by the pressing of spherical and ovoid shaped clay objects into the inner surface of the wet bullae (see Chapter 8, figure 8.17 and figures A.F-9 and A.F-10). The impressions all appear very similar in shape and width, likely caused by similarly shaped objects. They do not resemble manufacture marks, rather they are deliberate, deep depressions. It seems highly likely that as the excavators (Akkermans *et al.* 2012) agree, these objects are bullae, crafted to contain small clay

objects, holding them together, securely out of sight and fixed in place to prevent breakage in transit (by pressing them into the interior walls of the bullae, as discussed in Chapter 8, section 8.2a). The four known examples all come from just one operation of excavation on the main tell at Sabi Abyad, and from a single building within it. Though from two different stratigraphic levels, within the rooms of the burnt building, the different levels are separated by very little accumulation, and are unclear in some areas (see object contextual information in Appendix G).

Tell Sabi Abyad's bullae were clearly crafted to hold clay objects at Tell Sabi Abyad's operation II village of the late 7th millennium cal. BC (for location within site see figure 4.3), giving clear evidence of the role of the clay objects from this phase and area of settlement. Yet the function of the bullae seems to be more important that a simple container. Baskets, ceramics, whiteware vessels and stone bowls, as well as cloth and leather pouches are all attested at Tell Sabi Abyad. All are capable of containing clay objects. So why develop clay envelopes or bullae? It seems that an important factor in the function of bullae was the ability not just to contain a group of clay objects together, but to lock the objects inside, not only keeping them from view, but also preventing them from being seen and tampered with. The only way the contained clay objects could be checked, counted, removed or tampered within in any way would have been to smash open the container. This action could not be reversed or done in secret, therefore, it would be evident and indisputable if and when someone opened the bullae in order to inspect the clay objects inside. The shape of the contained clay objects is interesting, a diverse range of standardized geometric and naturalistic (vessel-shaped) clay objects are found in the Tell Sabi Abyad assemblage (see Chapter 8 and Appendix F). Though the shape of the operation II "tokens" has not been published, it is a reasonable assumption that the 57 "tokens" from the burnt building of operation II varied in shape (reflecting collections of clay objects from all other Tell Sabi Abyad contexts). Why therefore were only spherical, and possibly ovoid clay objects sealed inside bullae?

The impressions on the inside of the bullae are clear and seemingly intentional, in contrast to the absence of internal "token" impressions on the broken, published bullae of the 4th to 1nd millennium cal. BC (albeit a small number of example. Chapter 2.2, 2.3a and figures 2.1 and 2.35). The function of the internal impressions is unclear. They may have played a role, similar to the external token impressions on the 4th to 2nd millennium bullae, as a method of confirming the count, shape and size of the clay

objects inside. From the 4th millennium cal. BC, clay objects were impressed onto the outer surface of bullae, before being sealed inside. This allowed the recipient, and any intermediaries to verify the transaction without breaking open the bullae, with the contained clay objects checked and used to verify the transaction, by being checked with the external bulla impressions once the bulla was opened. The Tell Sabi Abyad impressions are on the inside, and are all very similar in size and shape, thus probably representing a more simple form of accounting. However their location on the interior surface seems unlikely to have been for verifying, as their checking would have required the bulla to be smashed and thus the continuing objects to be revealed. .

Alternatively, the impressions of clay objects on the interior surface of Tell Sabi Abyad's bullae may not have been made to be inspected, but as the result of the clay objects being pressed into the interior surface of the wet bullae, in order to secure them- preventing them from being damaged by bumping into the siders of the bulla, and into other clay objects. This second scenario therefore implies that the clay object-containing bullae were mobile; being transported as part of their function. Therefore, like the use of a bitumen-like substance or coarse sediment inside 4th millennium bullae, in order to prevent damage resulting from their movement of small clay objects inside sealed bullae, the apparent pressing of clay objects onto bullae walls of these Neolithic examples likely was a similar attempt to prevent damage (Chapter 8.2a).

The wider context of the bullae is also important. The building from which the bullae came contained 8 rooms, yet all four sets of bullae fragments were retrieved from room 3 only (see figures 4.3-8 and 4.3-9 for building layout). This room was one of the many which was heavily burnt by an intentional fire (only rooms 4, 6, 7 and 8 were unburnt). Room 3 also contained the building's highest concentration of "tokens" (n=34), which comprise 30.36% of room 3's artefact total. Groundstone tools, "sealings" and "jar stoppers" are also present in room 3 in abundance demonstrating a clear association of "tokens", bullae and sealings (table 4.3-2, figure 8.58 and tables 8.29, 8.30 and 8.31). Notably figurines only number 3 for the entire building (n=1 from room 3), and "pierced discs" though found in significant quantities in room 1, total just 2 items in room 3 (see Chapter 8.3 and tables 4.3-2 & 8.31). The assemblage of room 3 is therefore unique within the building, pointing to a specific and diverse use of space within the burnt building. Some rooms are completely devoid of artefacts whilst room 3, along with rooms 1 and 5 each contained over 100 items of a varied nature and in

diverse proportions within each room (table 4.3-2. Akkermans *et al.* 2012: table 2 p. 317).

Room 3 of building I, V6, operation II at Tell Sabi Abyad appears to have a strong association to administration, and the control of goods, in the presence of high numbers of both clay objects and sealings/jar stoppers. This along with the remains of numerous bullae containing spherical clay objects strengthens the interpretation of both the bullae and clay objects of operation II as accounting tools. Whilst the context of the clay objects of this operation points to their function in some sort of counting and or administrative archive sphere, the ritual significance of the burnt building in V6 cannot be underestimated. The placing of a burial inside an empty (aside from a single groundstone tool) room of the building (room 8, see figures 4.3-8 and 4.3-10), followed by the intentional and extensive burning of the building whilst many rooms were full of objects are all highly symbolic activities. Perhaps at the death of the woman marked a significant point in time-the end of the use of these artefacts-no longer needed or held their meaning once the women had died, been placed within the room and the building "closed" by burning. Whatever the interpretation, the evidence from Tell Sabi Abyad's operation II clearly links small geometric clay objects to the spheres of a complex accounting and recording system, in addition to the realm of ritual. The similarity of buildings at Tell Sabi Abyad operation I, level 6 to the operation II evidence, in terms of high concentrations of clay objects, sealings and other artefacts in certain rooms within large buildings, along with the intentional destruction of the village all points to mirrored behaviour at two different villages of the same mound, almost simultaneous in timing (see table 4.3-1).

10.5-SUMMARY

Broadly speaking, the small geometric clay objects evidenced across the span of the Neolithic Near East demonstrate similarities across a number of variables; manufacture, geometric shape and size for example. Spheres, discs and cones are most common overall. However analysis demonstrates that in the detail of their appearance: the range of different types of objects (assessed according to the many variables of craft and appearance studied) and proportion of these different types of clay objects present at each site, clay object assemblages are far from uniform. There is not a set repertoire of clay objects in circulation in the Near East, not within any region within the zone, nor time period. This is true not only in the case-study site assemblages, but corroborated by the tier 2 and 3 evidence. Clay object assemblages display variety across sites from

their initial appearance. The range of shapes, degree of elaboration, skill of craft or diversity of shapes does not increase nor decrease during the course of the Neolithic. Nor is any diffusion of clay objects style or diversity seen geographically across the region. Within a single site, the same is true; sites occupied for a significant period of the Neolithic do not see any significant change in the range of styles of clay objects, though many sites do see a marked increase in clay object numbers within certain periods of occupation.

Variation and diversity in terms of the range of clay objects as assessed by shape, size, and overall standardisation; both within and across sites, suggests their function was not universal. Indeed there seems to be no patterning in terms of type, number, standardisation or distribution of clay objects across certain regions or periods of the Neolithic Near East. As such, they are most definitely not part of a Near Eastern-wide symbolic system, understood, used and imbued with the same meaning across all sites in the region from the start to the end of the Neolithic period and beyond. Nonetheless, small geometrics are clearly intentionally made and often their context suggests they were deposited with agency; in precise locations and with specific items in many circumstances. They are most certainly not mere incidentally shaped pieces of clay, untouched by the human hand and the majority cannot be explained away as simply being unfinished figurines, beads or other artefact types. However, though valued for a time, their value was symbolic, and imbued rather than intrinsic (Watkins 2012: 24), as evidenced by the density of clay objects found in refuge deposits at many sites; clay objects were used, likely in the domestic sphere, and then readily disposed of once they had served their purpose.

Despite its overarching homogeneity, Near Eastern Neolithic society was complex and multi-faceted; with many variants within its regions and temporal phases. The detailed analysis of three large assemblages of clay objects (tier 1), alongside the study of their form at a large number of sites (tier 2) highlights the complex nature of both the artefact assemblages and the range of activities undertaken within and across sites. In this context, it seems neither relevant to assume a single, and consistent function for small geometrics across the entire geographic and temporal span of the Neolithic Near East, nor appropriate to assign an entire assemblage to a single, functional category within a single site. The plain, schematic and varied nature of much of the assemblages of the three case-study sites would suggest clay objects did not have a singular and unified purpose at each of these sites, but rather were multifunctional artefacts within

each. They can easily be divided into groupings according to shape, colour and size for example. These different groupings may indicate a transient function, and the utilisation of clay objects across different spheres within a single phase of a single settlement's occupation.

The absence of clay objects from some sites of the Neolithic Near East is due to differences in deposition and archaeological excavation and retrieval practices in many cases, however there is a *real* absence of clay objects at a number of sites. This absence does not appear to correspond to any particular environmental or geographical factors, yet may be linked to the type of site. Pınarbası is one such site with a definite lack of clay objects, despite being contemporary to, and in a very similar environmental setting to two sites yielding large numbers of clay objects, Pınarbaşı has clear differences to Boncuklu Höyük and Çatalhöyük in its lack of domesticated or cultivated crops, very small estimated community size, the non-permanent nature of its occupation and its limited evidence of ritual. This suggests the use of clay objects was likely related to ritual practice, and/or economic activity related to agriculture, necessitated by full-sedentary communities larger than a single small kin-group.

10.5(a) TELL SABI ABYAD

The assemblage from Tell Sabi Abyad, along with its context is the most informative in terms of the function of geometric clay objects. The use of the fragmentary bullae and the clay objects they once contained, along with the additional (tier 3 studied) clay objects from the burnt building (square V6, operation II) in not only counting, but the accounting sphere, is undoubted. Exactly how this system operated remains unclear, yet due to the identical shape of all clay objects inside all four of the bullae, the operation of a mnemonic system seems unlikely. Evidence of the use of clay objects within the accounting sphere from level 6 of operation I is equally as convincing. The archiving of groups of clay objects of different shapes, within specific rooms of buildings, along with the presence of large capacity stores and the securing of goods with the use of sealings, all point to a the existence of a complex administration system revolving around the acquisition, storage and exchange of various commodities. This latter interpretation is not new (Akkermans & Duistermaat 1996; Verhoeven 1999), yet varies in detail to previously published interpretations of the Burnt Village. The absence of bullae and the diverse appearance of the clay objects used in this area of the site suggests the system may have functioned differently to that of operation II, especially as the excavations of operation I revealed an entire village yet no bullae were

found. In contrast, the small, single 10m^2 area revealed in operation II yielded four bullae, all from a single building.

The presence of clay objects in almost all levels of occupation at Tell Sabi Abyad suggests that despite their apparent concentration in the Transitional Halaf period c. 6,000 BC (at both operation I and II, see table 4.3-1), similar economic practices involving the same range and number of clay objects operated in other settlement phases, especially in the periods immediately preceding and post-dating the burnt levels. The unique intentional burning of the operation I and II contexts preserved the clay object accounting system *in situ*, yet it can be interpreted as a rare and surviving example of more widespread accounting activity at Tell Sabi Abyad in the Late Neolithic. Tell Sabi Abyad's operation's I and II reflect a wider Late Neolithic tradition, particular to Upper Mesopotamia. A similarly standardized, and well-made range of clay objects, sealings bearing stamp seal impressions, stamp seals and (solid) bullae are found at both tells Halaf and Arpachiyah (see Chapter 9.4a and figures 9.26 to 9.30, A.H-29 and Appendix A). Additionally, Tell Arpachiyah has a heavily burnt building, which like those of operation I and II at Tell Sabi Abyad, was recovered full of a range of highly crafted items, including rooms with caches including clay objects and sealings. Though the strongest evidence from Tell Sabi Abyad supports the recording interpretation, small geometrically shaped objects were likely used in other spheres also – evidenced by the long duration of occupation at the site, the differing nature of occupations across the main and satellite tells and the hints of the use of clay objects within the ritual sphere (as seen at Sabi Abyad III, Chapter 8.3).

10.5(b) BONCUKLU HÖYÜK & ÇATALHÖYÜK

At Boncuklu Höyük and Çatalhöyük, where the contextual evidence is less informative that that of Tell Sabi Abyad, it can easily be imagined that sets of small geometric clay objects were used, and then reused, in a variety of functional spheres within each settlement and individual occupational phases within them. The general characteristics of Boncuklu Höyük and Çatalhöyük's geometrics reveal a lack of decorative elaboration. Yet at sites where highly crafted, elaborate artefacts in clay and other mediums are far from rare (especially at the latter) the decision to craft an abundant range of relatively plain and simple objects was more likely a deliberate choice rather than being due to technical restrictions. The significant degree of variation and relative lack of standardisation may indeed argue for a number of functions for the single category of clay object or "token".

At Çatalhöyük for example, the similarity of objects across various functional designations ("balls", "figurines", "clay object") highlights the complex, often subjective and inter-linked nature of the archaeological categorisation of artefacts. Perhaps it is more appropriate to rethink these traditional categorisations and view the small geometric and related objects less as having strict, clear, singular functions and more as groups of objects that had multiple, fluid, transient roles, as well as interchangeable symbolic meanings. Small clay objects are often difficult to differentiate from figurines and figurine fragments at Çatalhöyük and many other sites studied. As the exact function of many such objects (figurines, stamp seals and so on) in the Neolithic in general is unknown, the functional categorisation of such objects is often arbitrary, subjective and therefore inconsistent. As an intentional element, the austere nature of clay objects may have allowed them to hold interchangeable meanings and functions according to the context and manner in they were utilised. Different sub-types of geometric clay objects (i.e. discs) may have been used together as a group for the same range of functions related to their form, either alone, or in conjunction with related sets of clay objects (i.e. cones), or other small clay artefacts such as figurines. The clear contextual evidence pointing to the use of clay objects within accounting seen in operations I (Level 6) and II of Tell Sabi Abyad demonstrates the expected type of clay object deposition, and contextual setting of clay objects when used in administration. A comparative example is seen in Tell Arpachiyah, yet not at Boncuklu Höyük or Çatalhöyük. Does this then cancel out the possibility of clay objects having been used in accounting at these two sites?

(i) Counting & Recording at Boncuklu Höyük?

Counting and accounting suggests very specific social practices in relation to socio-economic transactions, sometimes related to hierarchy and social control. The consistency of building plans, orientation and internal characteristics suggest some areas of household social practice were standardized at Boncuklu. However, the site is small, food preparation and consumption appears to have taken place both within buildings and in communal open areas, suggesting food preparation, cooking and consumption was undertaken both on a household and community level. Therefore counting devices or indeed the casting of lots may have had a role in the communal access to food.

The layout of Boncuklu Höyük is organic rather than planned, and there is little evidence for storage (in which case the very small proportion of definite sealings is fitting). Evidence for hierarchy, socio-economic control and direction is marginal (Baird *et al.* Forthcoming). However the presence of domesticated cereals suggests people may have needed to keep track of crop quantities and their produce (counting the days from sowing, harvesting, and the quantities harvested, stored and distributed or exchanged). Likewise, though animals were hunted, people may have wanted to use clay objects to count portions of meat from hunts in order to distribute it fairly, or to calculate how much each person/household was to be allotted if food was parcelled out on an egalitarian basis. In addition, the presence of imported materials (obsidian and marine shell for example) suggests the residents were engaging in trade and exchange with different communities in order to acquire such materials.

The distribution of clay objects at Boncuklu is vastly different to that seen at Tell Sabi Abyad's operation I Burnt Village, or operation II's burnt building. Boncuklu does not contain any large, multi-roomed buildings, nor any distinctive storage rooms or buildings within an exclusive storage function. Yet this does not exclude the potential for clay objects to have been used as part of a different, simpler accounting technique. Though not overwhelming, the evidence from Boncuklu suggests geometric clay objects may have been used by individuals, households, or larger groups, to count, distribute and/or record a number of things or help decide access to materials, objects and resources. This is reflected in the spatial analysis of the objects, which evidences their use in both the communal midden areas signifying group use as well as within the private space of buildings. Clay objects are present in huge numbers in middens, yet are most dense in the contexts that come from within buildings suggesting that both individual and communal use was important. They are present throughout the sites occupation, across the entire site, changing little through time, indicating their role was also universal and unchanging.

Clearly the greatest concentration of clay objects comes from Boncuklu Höyük's middens (n=266). This large proportion of midden objects makes it difficult to quantify the exact number of households that may have used clay objects as Boncuklu middens were extensive, versatile spaces, certainly including material swept out of the interior of houses (thus representing household use) as well as refuse from other sorts of *in situ* activity performed presumably communally, within these open midden areas (representing larger scale, communal use). In addition to the midden evidence

however, the presence of objects from the "floor contact" context type and the fact that two of the three most dense context types relate to domestic spaces ("pit fill": 1.00/l and "floor surface": 0.92/l), is clear evidence of the utilisation of geometric clay objects within the private space of the home.

From the study of specific buildings containing objects from within these context types, plus other contexts signalling in-house use (post fill and hearth fill, and GIS analysis revealing concentrations around hearths), it is clear all buildings at Boncuklu may have contained at least a few clay objects. This is not to say that each and every Boncuklu resident used the objects, or that every household contained a clay object at all times as the buildings were not all simultaneously occupied. However it seems clear that within each phase of occupation, geometric clay objects were used inside most of the domestic buildings by individuals or households in addition to within the external, midden areas – as suggested by their distribution across individual buildings and their density within certain house context types. Their relatively low density within middens suggests that they were not particularly connected to activities generating midden deposit. However their numbers in middens suggest they may well have been used in the open areas in which midden deposits formed, especially in Area M where *in situ* activity is clearly connected to midden formation. "Burial-fill" and "pit-fill" contexts have amongst the highest density of clay objects, however the these context types, especially burials, may represent the accidental deposition of geometric clay objects within fill, likely if midden material was used to fill burials and pits or if refuse lying on the floor surface was also accidentally incorporated into the fills of adjacent burial cuts and pits.

In contrast, nearby Pınarbası has no evidence of clay objects, suggesting that despite many strong similarities as seen in architecture, material culture and environmental setting (see Chapter 4.1), the on-site activities carried out at Pınarbası differed significantly to those of Boncuklu. The main difference between 9th millennium Pınarbası and Boncuklu Höyük is the increased sedentary nature of settlement at Boncuklu and the reliance on both wild plants (with a corresponding absence of both einkorn and emmer wheat in either their wild or domesticated form) and animals at Pınarbası. These economic differences therefore, seem key in the introduction of the use of clay objects, which in turn strengthens the interpretation of their function being economic based.

(ii) Counting & Recording at Çatalhöyük?

Such a large site (in terms of population and space), which utilized a wide range of raw materials and operated a wide range of craft and subsistence activities, could have had many requirements for multi-purpose clay objects, which may have crossed practical, social and ritual spheres. The need to count and account for a diverse range of items is clear from the evidence of activity, crafts and subsistence at Çatalhöyük. This increased diversification, along with the huge increase in site size and density of settlement (in comparison to Boncuklu Höyük), as well as the increased evidence of storage supports the interpretation of at least one of the functions of Çatalhöyük's abundant small clay (and stone) objects as being in the accounting sphere. Yet like Boncuklu Höyük, strong definitive evidence of the use of clay objects in accounting, comparable to that of Tell Sabi Abyad is absent. Though significantly larger and subdivided buildings are present, and a vastly increased capacity for storage is seen within both the main space, and annexes of buildings at Çatalhöyük (Chapter 4.2), external, purpose built storage buildings are missing. All storage is within the private space of the house. This may explain the absence of definitive sealings and impressions of stamp seals at Çatalhöyük, (suggesting the stamps of Çatalhöyük had an alternative, non-administrative function. See Chapter 4.2), as the residents did not need to seal, label and secure their stored goods (as they were not kept in public or accessible spaces). However, clay objects could still have been useful in the domestic accounting realm.

The distribution of geometric clay objects within households at Çatalhöyük remains an open question. Only a relatively small proportion have been recovered from within secure building contexts (such as room or building fill). Like Boncuklu Höyük, the majority of Çatalhöyük's clay objects come from middens. As middens represent material from the interior of houses in the form of hearth rake-out and floor sweepings (Shilito 2010: 139); in theory, all households may have contained clay objects at one time. As Çatalhöyük's houses are closely compacted, with middens slotted into the rare open spaces in-between houses, it seems reasonable to assume the majority of "midden" clay objects originally came from inside houses, as opposed to other locations. The temporal evidence from Çatalhöyük (e.g. Czeszewska 2014) is especially relevant. The peak time of change at the site is in Mellaart Level VI, mid-way into settlement at Çatalhöyük East, and the latest level of settlement within the broadly grouped, *earlier* set of occupational levels (Mellaart Levels XII to VI). Fewer clay objects are found in the *earlier* occupation at Çatalhöyük (Chapter 7.4b. figures A.C-12,7.17, 7.18 and 7.19; tables A.C-8 and A.C-9). Though this may be a bias in the sampled

selection, it is also interesting that all of the *possible* sealings are found in the upper Neolithic levels (Mellaart Levels V-I) and a corresponding increase in "mini balls" is also seen in the later levels (Appendix D). In the later (post-level VI) Neolithic levels, there appears to be a shift from a communal to a differentiated society, with houses becoming more diverse and larger houses appearing. Demarcated external yards and an increase in narrative art are also seen. More relevant to the clay object interpretation is the correlation of the increased number and density of clay objects in the later levels of Çatalhöyük (figures 7.17, 7.18 and 7.19) to the probable appearance of herding (the marked increase in sheep within Çatalhöyük's later levels, alongside the significant increase in cattle number, see Chapter 4.2). These changes in subsistence and living arrangements, along with the increased presence of clay objects suggest people had an increasing need to keep track of personal or household commodities, as well as a wish to record not only goods and transactions but also events. Interestingly the "mini balls" of Çatalhöyük (Chapter 7 and Appendix D) show a different contextual patterning to all other geometric clay objects from the site. With the majority coming not from middens, but from buildings, being recovered *in* situ rather than being found loose in fill, and most commonly cached with alike objects, the context of these "mini balls" (total of over 1,000 recovered from the site) strongly suggests that at least some of Çatalhöyük's many geometric clay objects did indeed function in the administrative realm.

(iii) Other Functions at Boncuklu Höyük & Çatalhöyük

In the fluid and transient interpretation of clay objects suggested above, the use of clay objects in counting and recording, though plausible is only one of a number of potential interpretations at these sites. Gaming, the drawing or casting of lots and divination all seem plausible and indeed possibly interrelated. For example, games can be played for the purposes of divination or decision making, the casting or drawing of lots may have ritual and religious aspects in decision making. These activities are likely to have been carried out on the Konya plain. With the increasing community size and diversification through time, as exemplified by the comparison of Boncuklu Höyük and Çatalhöyük, there would have been an increased need for ritual activity, new mechanisms in decision making and community organisation. In all three activities, small objects of various forms could be used-including objects varying in raw material, shape, the degree of similarity of difference. The residents of sites where clay objects are seemingly absent therefore, in particular Pınarbası, may have participated in the activities listed above, yet using tools which left no trace. Alternatively, the absence of

clay objects at some sites could infer a lack of corresponding ritual activities involving the drawing or casting of lots and gaming for decision making purposes.

An increase in symbolic expression through time is seen when comparing Boncuklu Höyük and Çatalhöyük; the ritual and symbolic behaviour of Çatalhöyük's inhabitants echo's practices seen slightly earlier at Boncuklu Höyük, yet is expressed in a far more conspicuous way. Pınarbası in contrast, both the 9th and 7th millennium occupations (overlapping with settlement phases at both Boncuklu Höyük and Çatalhöyük, see timeline figure 10.1) displays a far reduced degree of ritual and symbolic expression (Chapter 4.1 and 4.2). This, coupled with the absence of clay objects could suggest the lack of a formalised decision making mechanism at Pınarbası, and other with an absence of clay objects. Perhaps the community of Pınarbası was too small to need such a facility, or its small population, coupled with the reliance on the gathering of wild plants and hunting of wild animals meant that a small, successful, egalitarian community had no need for formal social organisation or ritual mechanisms.

10.5(c) WIDER NEAR EAST

Examination of the tier 2 and 3 sites demonstrates that far from being a central Anatolian phenomenon or one relevant to sites in the Halaf zone, small geometric clay objects are found at sites across the Near East. If these objects were utilised in an activity only necessitated by the transition into settled, agricultural communities (namely counting and accounting) they would only be found at such sites. This *does* appear to be the case, with clay objects definitively lacking at fully sedentary settlements, and those lacking agricultural activity (such as 9th millennium and 7th millennium cal. BC Pınarbaşı). However the presence of clay objects at non-residential ritual sites does not follow this patterning. Yet the non-residential nature of many ritual sites (Göbekli Tepe and Kfar HaHoresh for example) is contentions. Furthermore, these so-called ritual sites would have been utilised by people from a number of nearby sedentary farming communities. As the meeting place of large numbers of people from multiple communities – these ritual or festival events would have been an ideal place for people to trade and exchange produce, goods and raw materials-necessitating the use of small clay objects in counting and perhaps accounting activities. This is not to exclude the use of similar objects in purely the ritual sphere. Regardless of the interpretation of their function, the complete or relative absence of clay objects at some sites remains perplexing. If commonly used for ritual, than why are clay objects only

found in very small numbers at a large site abundant in evidence of a ritual nature such at 6th millennium BC Domuztepe?

Similarly, the complete absence of clay objects (e.g. at Shir) or presence only in very small numbers at complex agricultural villages (such as Aşıklı Höyük) demonstrating clear evidence of plant and animal domestication, a wide variety of finished goods, a diverse range of raw materials and a population of significant size, is equally as perplexing. This contrast makes the complex accounting of Tell Sabi Abyad, Tell Arpachiyah, Tell Halaf and other Late Neolithic North Mesopotamian sites even more distinctive. Differences in the structure and nature of different communities may solve this problem. The accounting of agricultural produce was perhaps not needed at all farming villages. At some, farming and subsistence activities could have been negotiated on a family or extended family basis, with food being sorted and shared within kin groups. Food resources may have even been shared community wide if for example one kin group's crops or animal food source failed. Groups with less storage space within the domestic sphere (perhaps necessitated by the presence of more unproductive members, children or elderly members for example) may have at times utilised a separate storage room or free standing silo, yet the small size of the community, and the year round sedentary nature meant they did not need to protect their goods from other community members' tampering (unlike the speculated nomads at Sabi Abyad's level 6 village). The lack of sealings and external storage complexes at many Neolithic village sites supports this notion. The presence of stamp seals at Neolithic sites is often used as an indicator of the practice of sealing, yet as discussed in Chapters 3 and 4, the two are not always related (both Çatalhöyük and Shir have quantities stamps, yet no sealings or impressions of stamps in clay or otherwise).

The evidence from the wider Near East, the diverse characteristics of the sites which contain and lack clay objects, as well as the difference in the diversity of object shape, clay object distribution (temporally and across contexts of a different nature within a single site) all highlight the multiplicity of contexts in which clay objects are found. Even when present at sites with strong evidence of highly ritual and symbolic behaviour such as Çayönü with its Skull Building and other "communal" structures, clay objects may have been used in completely separate areas of the site to those evidencing ritual activity (as at Çayönü where they are found only in residential areas). Rather than being related to economic change, the use of clay objects in the Near East seems

more likely tied into different social practices, sometimes, yet not always involving economic activity.

Differences in social practices within communities across the Neolithic Near East may also explain the lack of the need for clay objects in divination or the casting of lots. At some small, egalitarian communities such as Pınarbası, important decisions may have easily been made collectively, at a community level. Yet may have also been decided upon by a single respected person, community leader, or small committee of selected people. The ability for site-wide decisions to be easily made and agreed upon, without the risk of fissioning or aggression in retaliation, would not create the need for the use of small clay item in the casting of lots. Clay objects may not have been an essential part of the Neolithic package, yet may still have performed a number of roles integral to the Neolithic way of life at the sites where they are present. The same functions and activities may have been equally as easily carried out using other tools at sites lacking in clay objects, or not needed due to the diverse nature of the Neolithic of the Near East.

ILLUSTRATIONS

FIGURES:

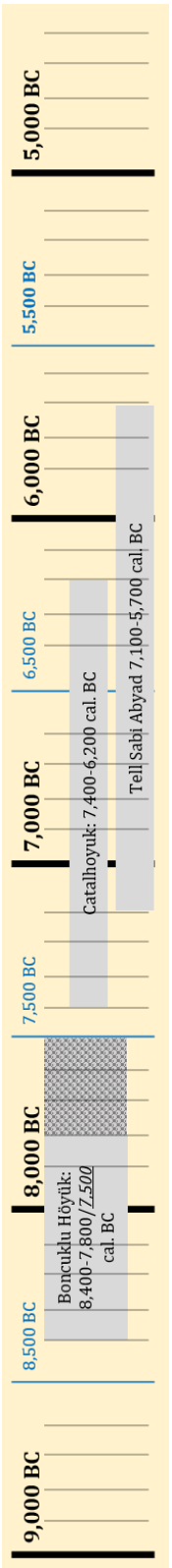


Figure 10.1: Chorological comparison of the time periods during which each case-study site was occupied (in approximate years calibrated BC (Boncuklu Höyük's latest levels are yet to be carbon dated, therefore, the end of the occupation here, marked in cross hatching, is uncertain).

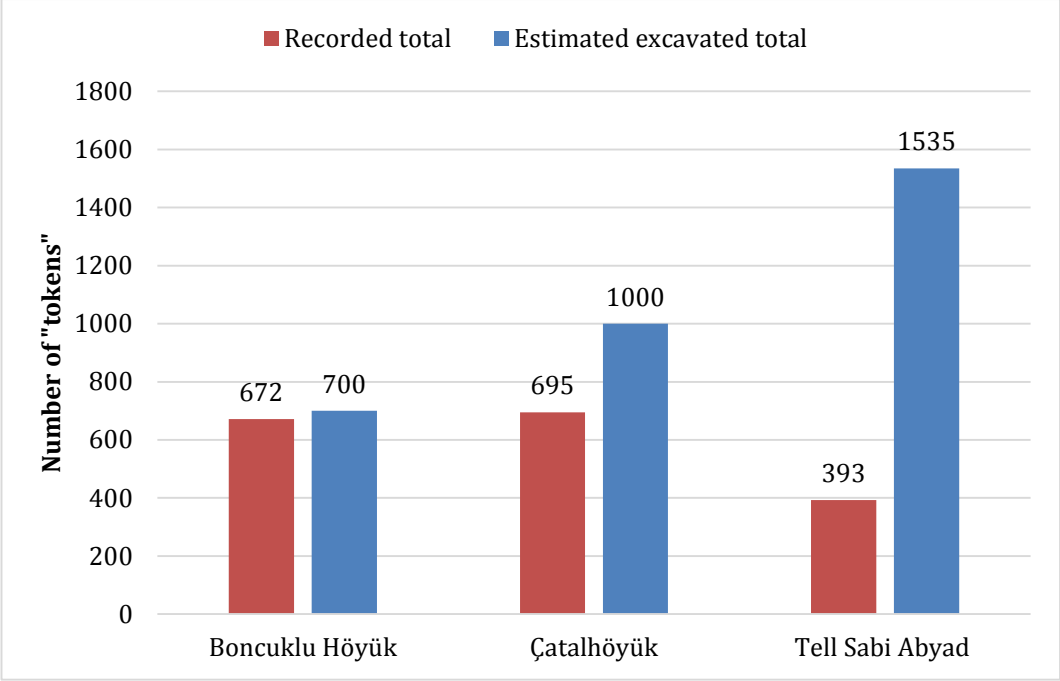


Figure 10.2: The number of small geometric clay object recorded at each of the three case study sites, along with the estimated total number excavated.

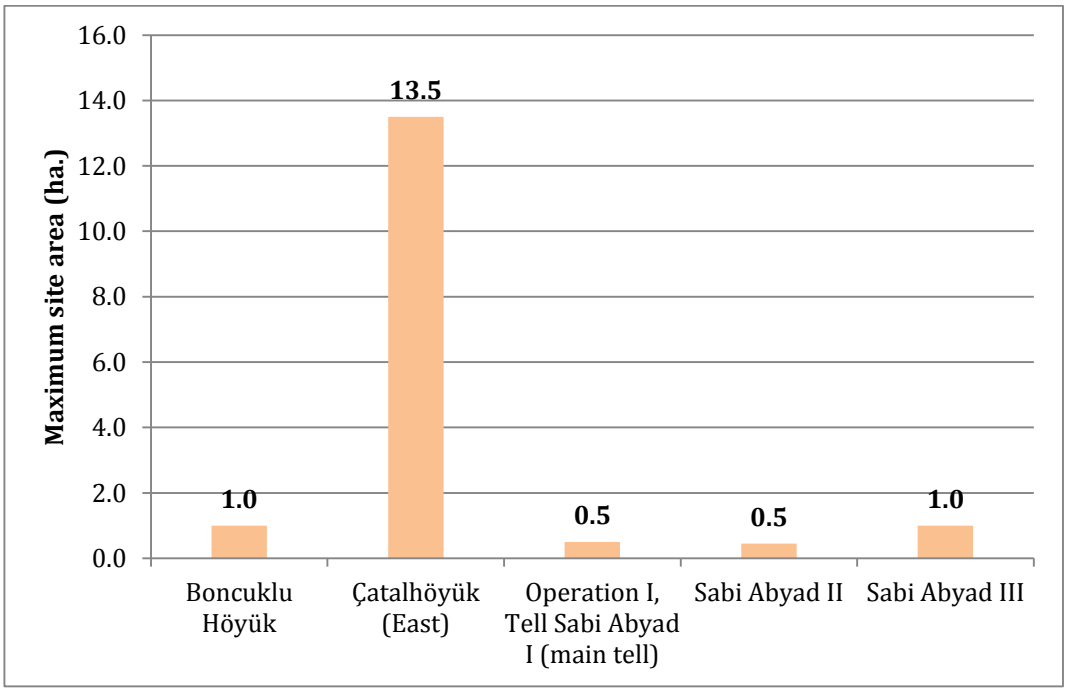


Figure 10.3: Estimated total site area in hectares, for each case-study site (and selected settlements within Tell Sabi Abyad).

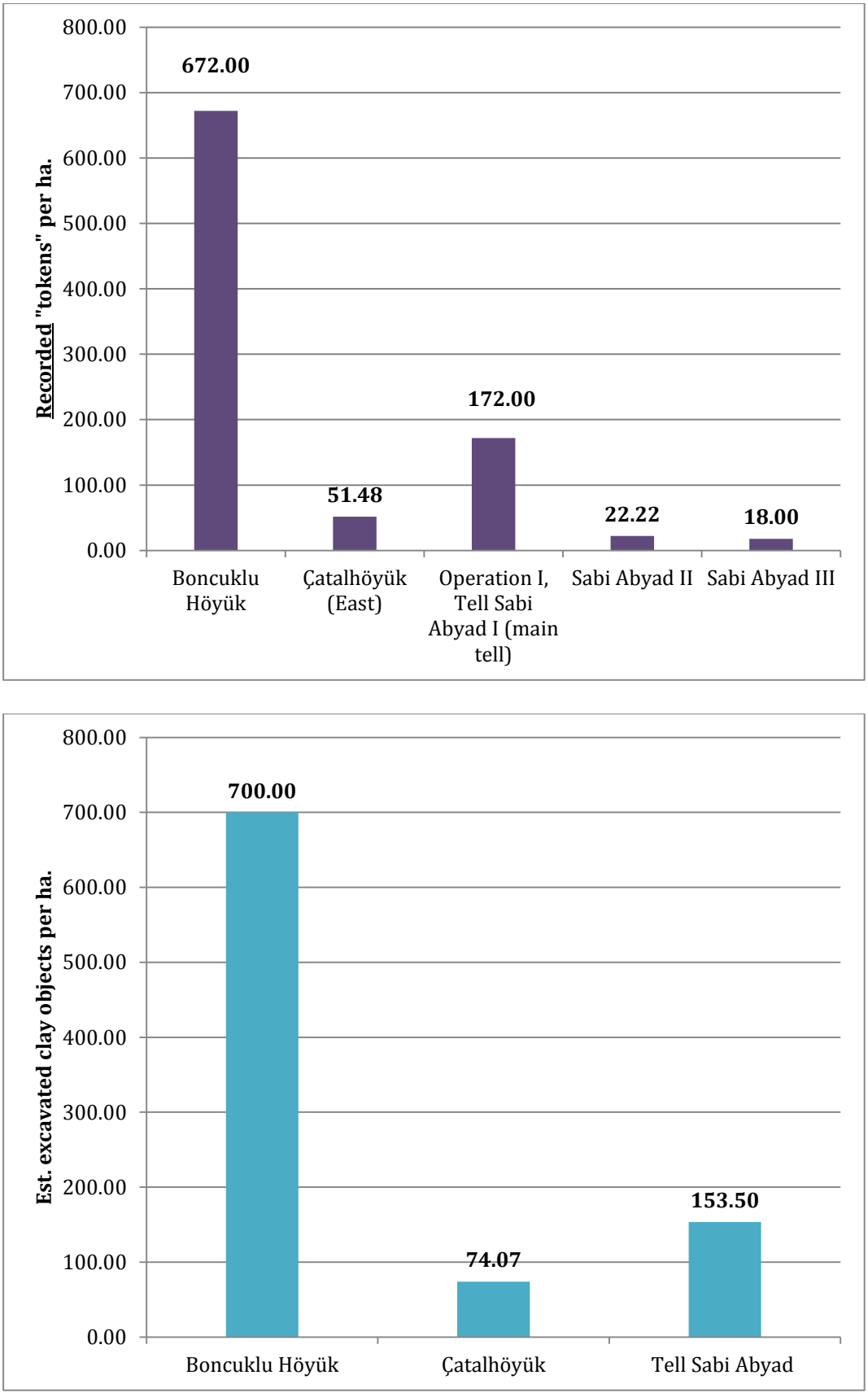
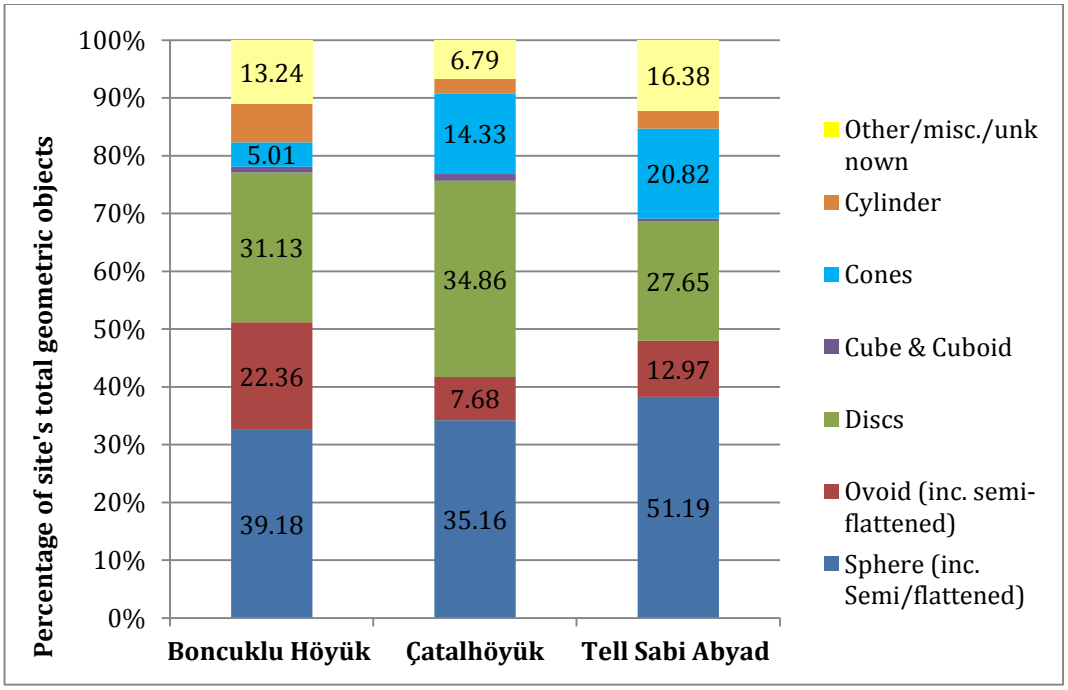


Figure 10.4: Number of clay objects *recorded* in this study **(top)** and estimate of the total number *excavated* **(bottom)** per hectare at each of the case study sites (estimated area of entire area all 4 mounds at Tell Sabi Abyad combined: 10ha.).



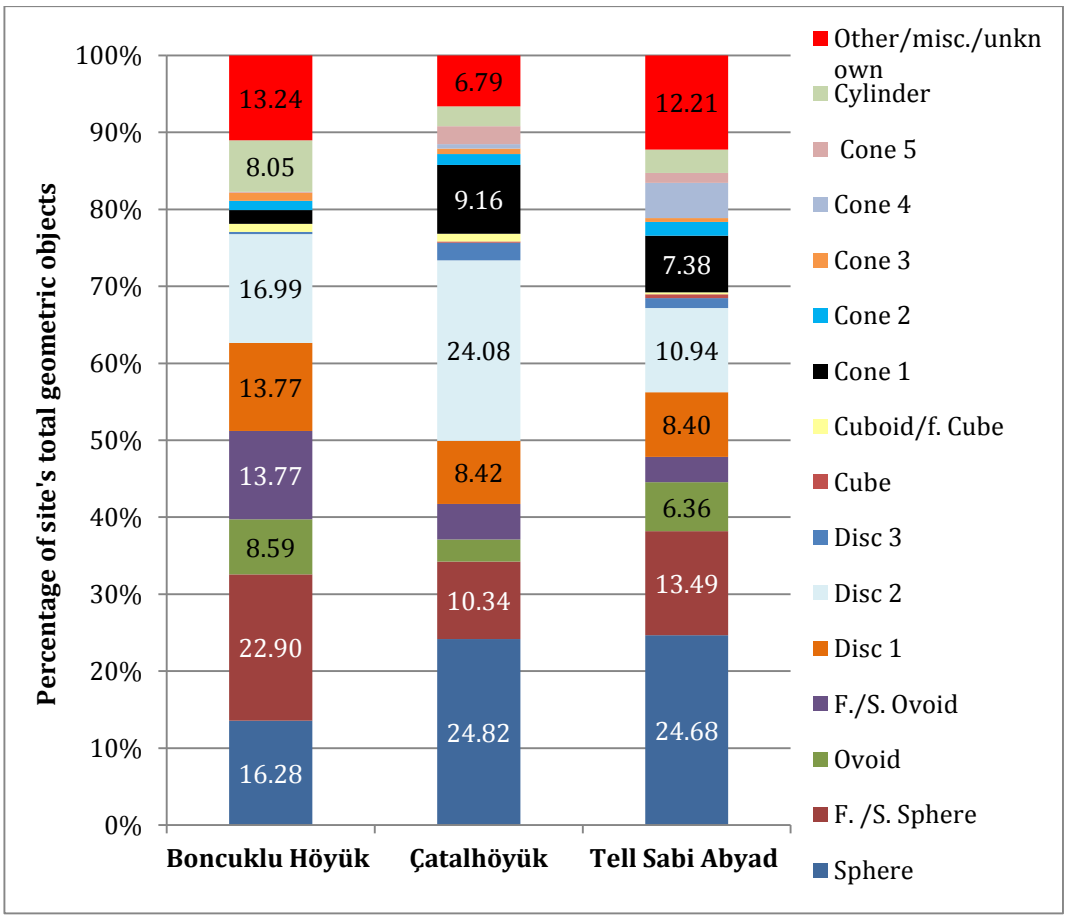


Figure 10.5: Comparison of the range and proportion of three-dimensional shapes represented at the three case-study sites. **(Top)** basic shape and **(bottom)** detailed shape (shapes representing 5% or greater of a site's assemblage are marked).

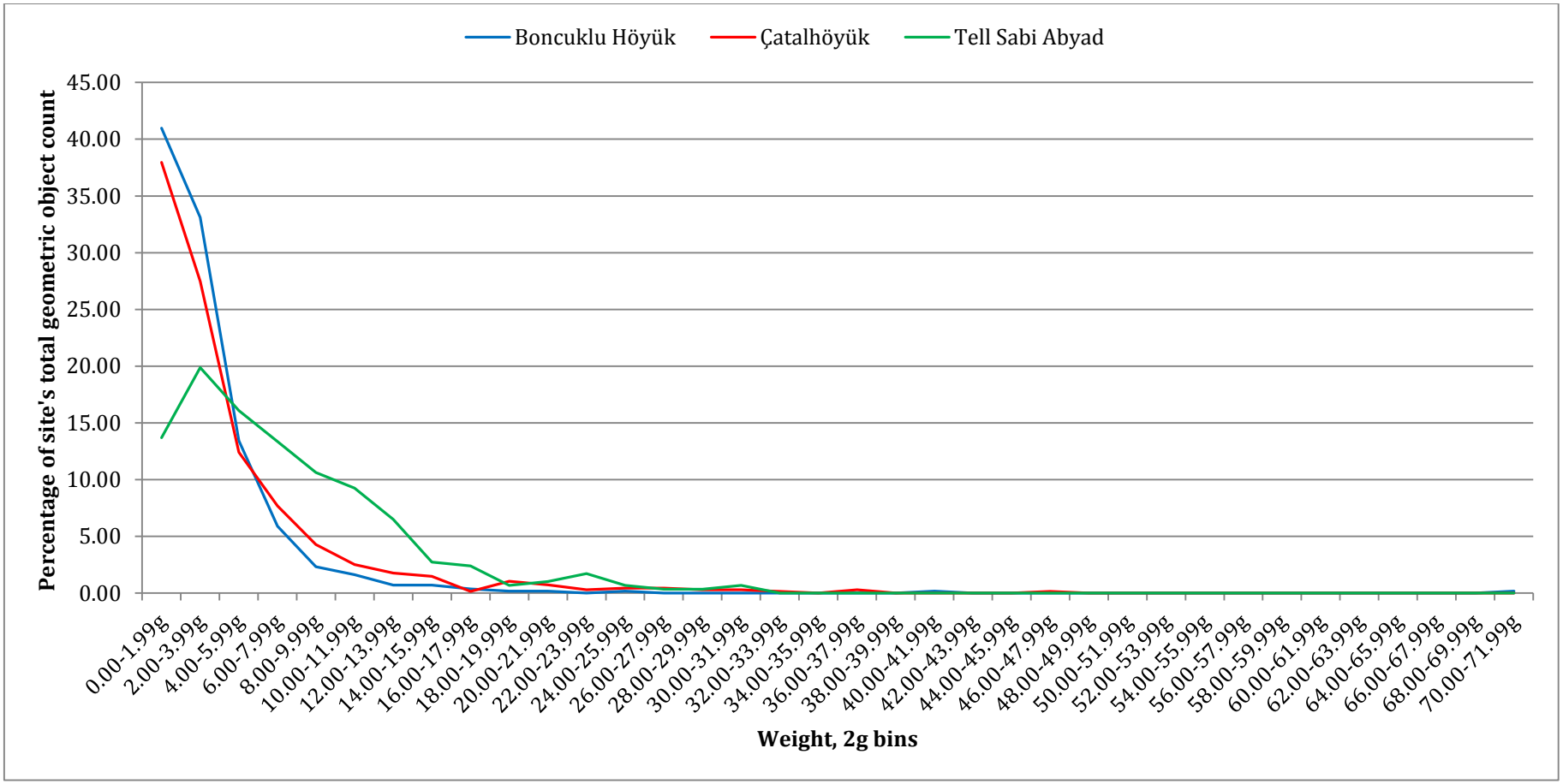


Figure 10.6: Comparison of recorded geometric object weight range and proportions, in 2 gram bins.

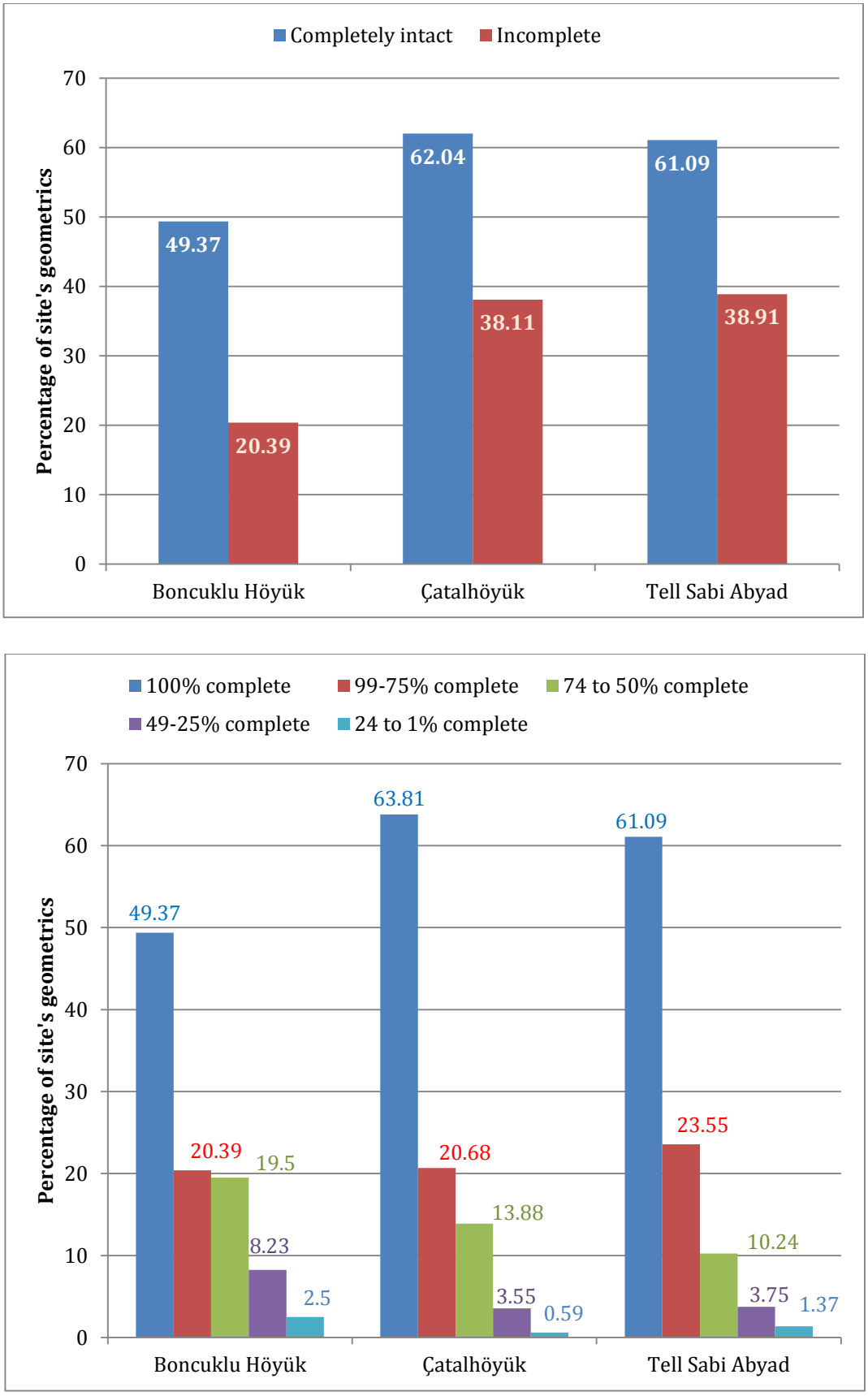


Figure 10.7: Object fragmentation at the three case-study sites. **(Top)** proportion of clay objects complete versus incomplete. **(Bottom)** degree of fragmentation.

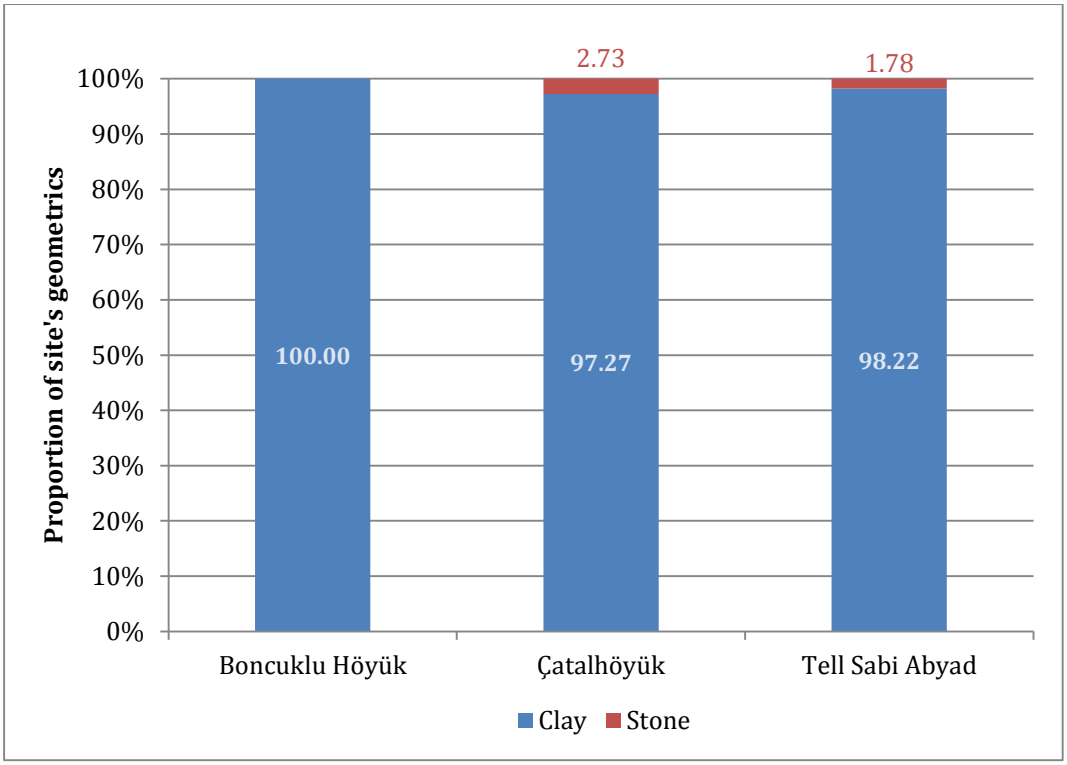


Figure 10.8: Comparison of the raw material used in crafting geometrics across the three case-study sites; the proportion of clay (dark) versus stone (light) geometrics.

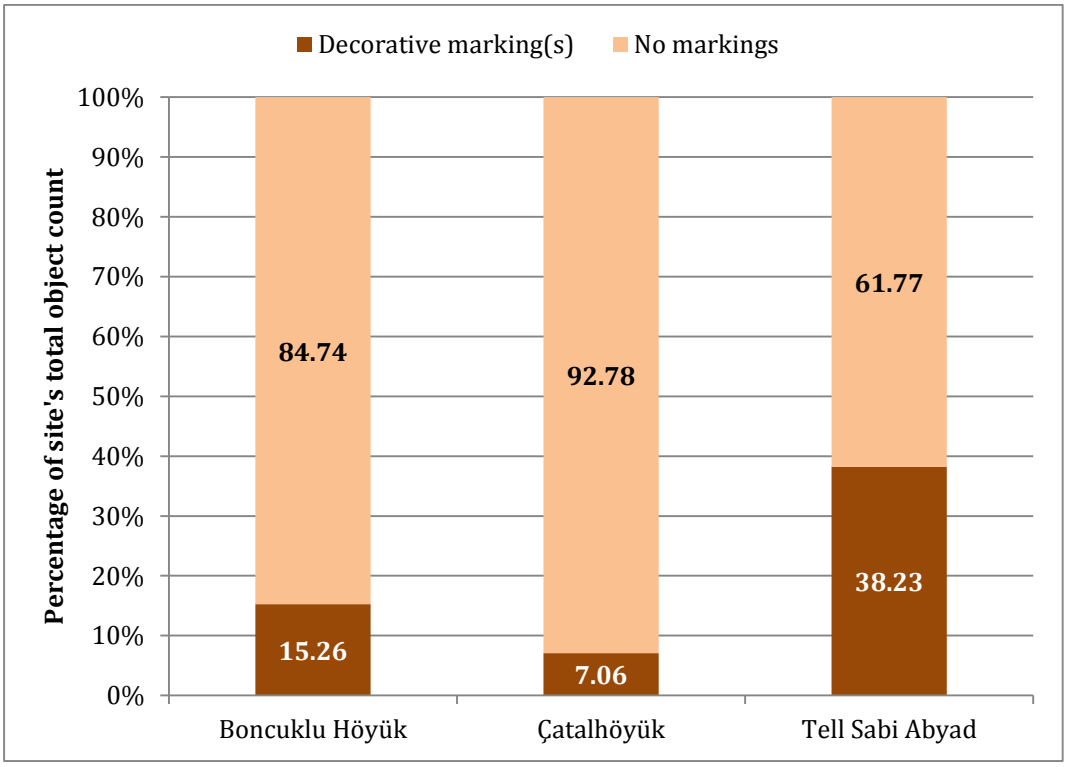


Figure 10.9: Comparison of the presence of intentional, decorative markings (as a proportion of each site's total recorded token count) at each case-study site.

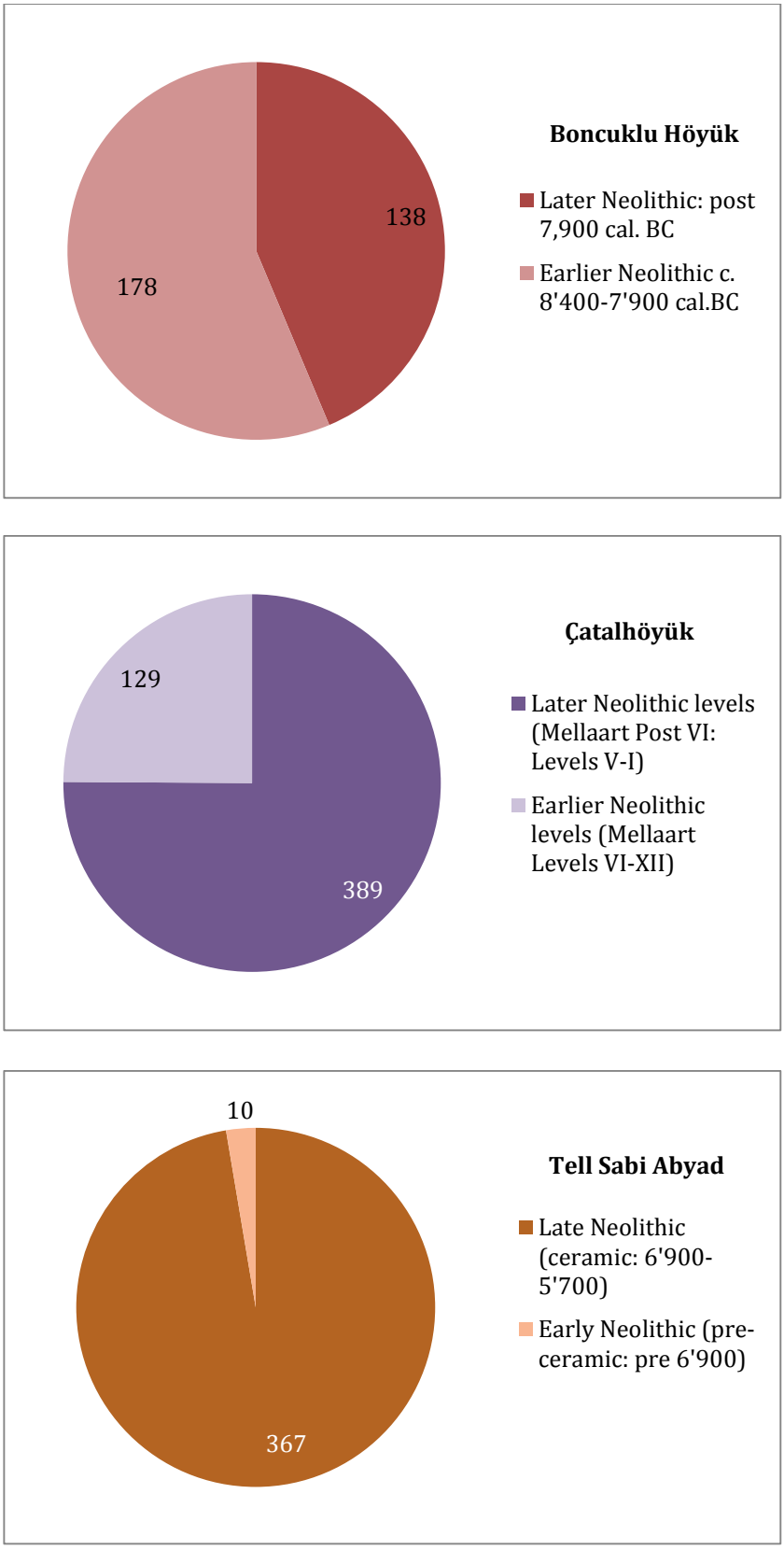


Figure 10.10: Comparison of the number of clay objects recorded per site according to broad phase of occupation (all areas of each site combined); **(Top)** Boncuklu Höyük, **(middle)** Çatalhöyük (East) and **(bottom)** Tell Sabi Abyad.

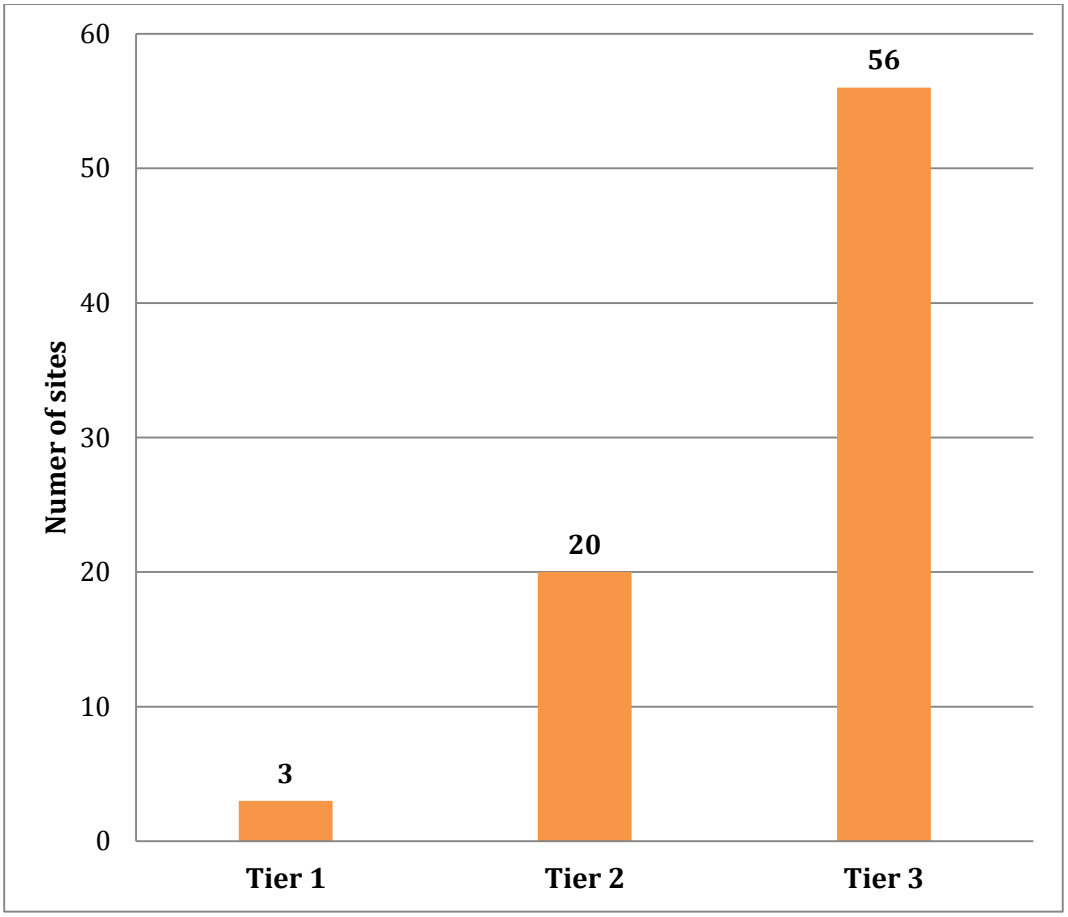


Figure 10.11: Number of sites studied according to the tier at which their small geometric clay objects were recorded.

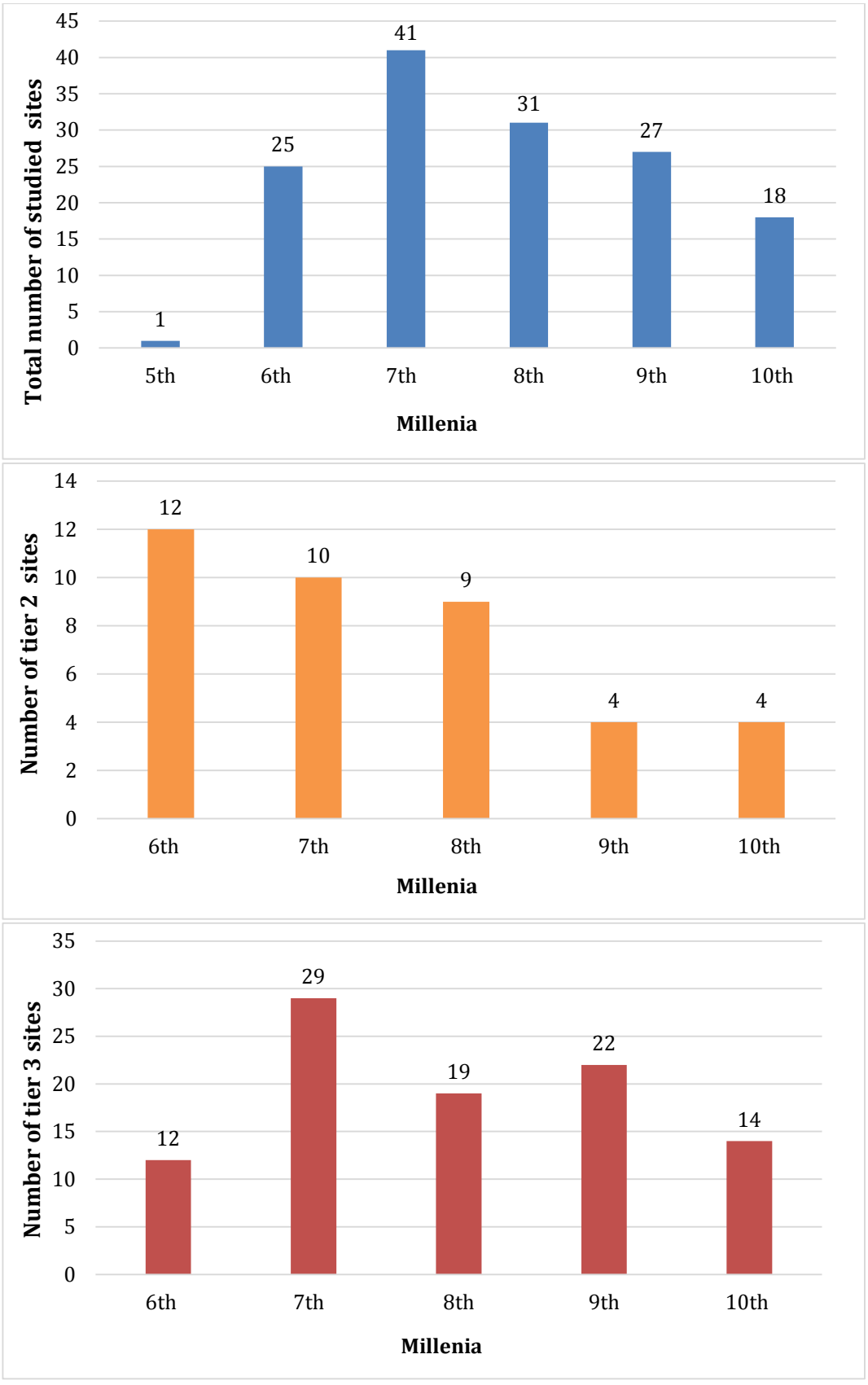


Figure 10.12: Temporal range (in years calibrated BC) of Neolithic Near Eastern sites studied (at tier 1, 2 and 3 levels). **(Top)** all sites combined (n=79), **(middle)** tier 2 sites only (n=20) and **(bottom)** tier 3 sites only (n=56).

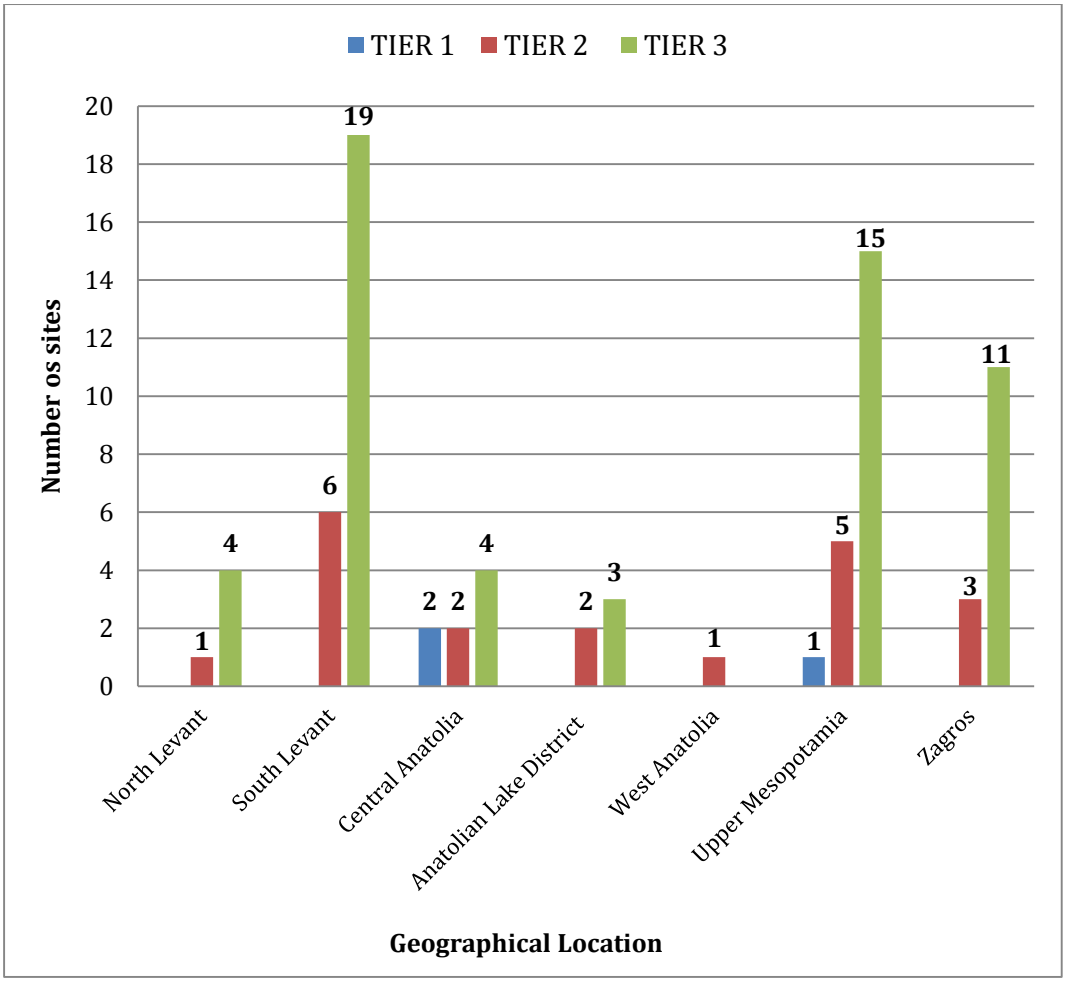


Figure 10.13: Geographical distribution of studied sites according to tier of recording.

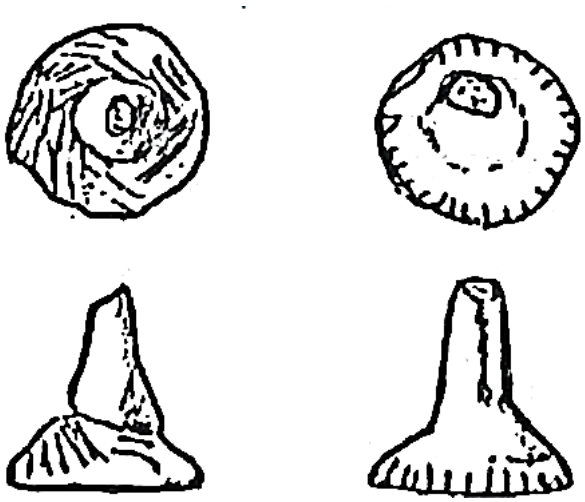


Figure 10.14: Small, cone-shaped geometrics recorded from 7th to 6th millennium cal. BC site of Sarab (Zagros region); displaying decorative markings in the form of fingernail impressions. CO#s 2632 & 2633. (Broman Morales 1990: pl. 15 h & i).

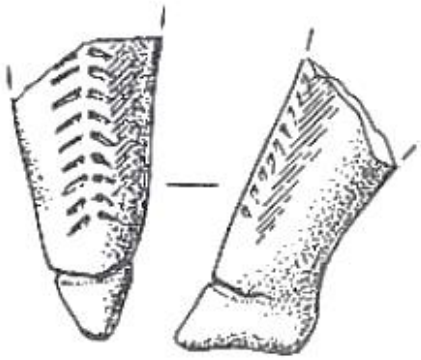


Figure 10.15: Fragment of a (female?) figurine fragment displaying decorative markings in the form of fingernail impressions. From the 6th millennium cal. BC site of Sha'ar Hagolan, Southern Levant. (Garfinkel, Korn & Miller 2002: fig. 13.19.2 p. 200).

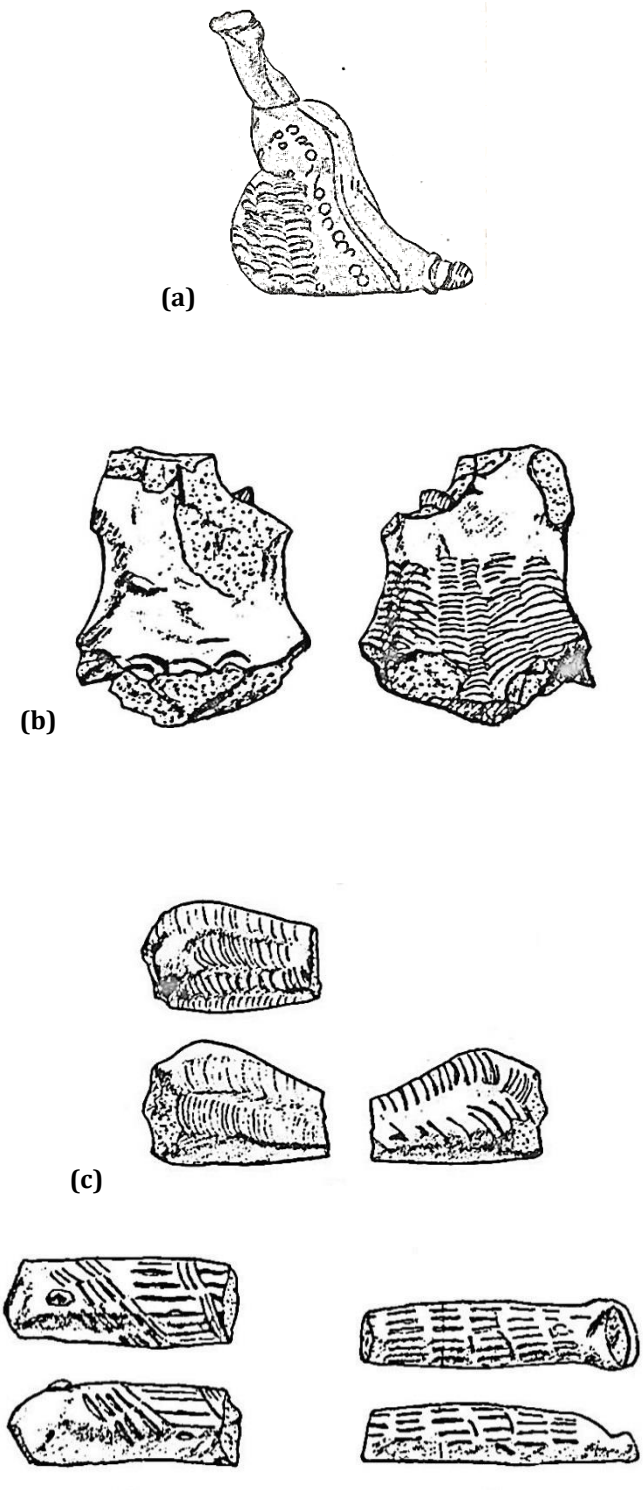
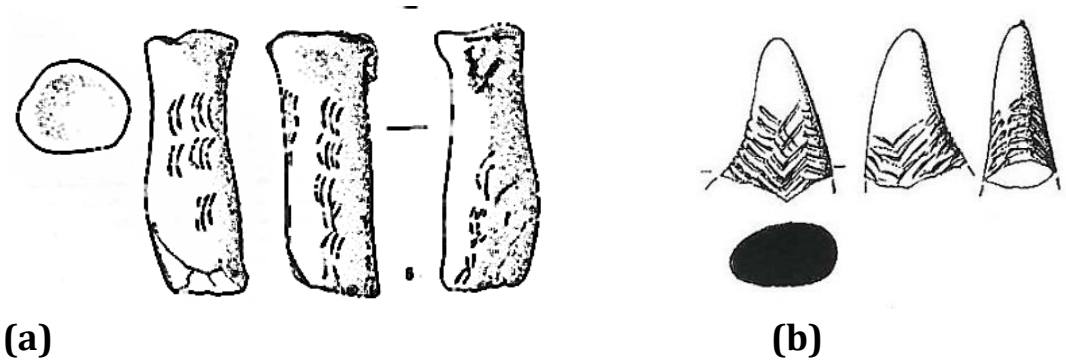


Figure 10.16: Female figurines and other intentionally crafted clay artefact fragments displaying similar decorative markings to the cones from Sarab-crated using fingernails to make impressions. **(a)** Female figurine, **(b)** torso fragment from a female figurine, **(c)** other fragments of clay artefacts (classified as "Abstract form" "Lady Stalk" female figurines). (Broman Morales 1990: plates 6-e, 8-g & 11-l, n & o).



(a) (b)

Figure 10.17: (a) Female figurine. **(b)** Cone-shaped clay fragment, possibly a leg from a female figurine. Both from 10th millennium cal. BC Gilgal I, Southern Levant. (Hershman & Belfer-Cohen 2010: fig. 11.7.5 p. 196, fig. 11.9.2 p. 197).

Figure 10.18: Shir, 7th millennium BC cal., West Syria. **(Top)** Room 47 within the northern "storage complex": Building A (Area N 20-121, unit 47) showing storage vessels *in situ*. **(Bottom)** View of the northern excavation area showing the "storage complex": comprising Buildings A (far right), B and C (Bartl, Ramadan & Al-Hafian 2011: fig. 2 & 3).

TABLES:

SITE NAME	RECORDED GEOMETRICS	MAX. SITE AREA (HA.)	GEOMETRICS PER HECTARE
Boncuklu Höyük	672	1.0	672.00
Çatalhöyük (East)	695	13.5	51.48
Operation I, Tell Sabi Abyad I (main tell)	86	0.5	172.00
Sabi Abyad II	10	0.5	22.22
Sabi Abyad III	18	1.0	18.00

Table 10.1: The number of small geometric clay object recorded at each of the three case study sites, compared their size and the number recorded by total estimated site size (in hectares).

SITE	MINIMUM	MAXIMUM	AVERAGE	MINIMUM-100% INTACT OBJECTS ONLY
Boncuklu Höyük	0.05	70.7	**3.38**	0.05
Çatalhöyük	0.05	46.5	**4.46**	0.05
Tell Sabi Abyad	0.20	31.20	**7.45**	0.20

Table 10.2: Minimum, maximum and average token weights (in grams) at the three case-study sites.

ANCIENT REGION	**TOTAL NUMBER OF SITES STUDIED**	NO. OF SITES WHERE SMALL GEOMETRIC CLAY OBJECTS ARE **REPORTED AS PRESENT**	NO. OF SITES CLAY OBJECTS ARE SPECIFICALLY **STATED AS ABSENT**
Central Anatolia	**4**	**0**	3
A. Lake District	**3**	**1**	0
North Levant	**4**	**3**	1
South Levant	**19**	**10**	2
U. Mesopotamia	**15**	**7**	0
Zagros	**11**	**9**	0
MILLENNIA OF OCCUPATION	**TOTAL NUMBER OF SITES STUDIED**	NO. OF SITES WHERE SMALL GEOMETRIC CLAY OBJECTS ARE REPORTED AS **PRESENT**	NO. OF SITES CLAY OBJECTS ARE SPECIFICALLY **STATED AS ABSENT**
10 MBC (only)	**3**	0	0
10 AND 9 MBC	**5**	2	0
10 - 8 MBC	**5**	4	0
10 AND 8 MBC	**1**	0	-
9 MBC (only)	**6**	3	0
9 AND 8 MBC	**3**	2	0
9 - 7 MBC	**1**	1	-
9 - 6 MBC	**1**	0	0
9 AND 7 MBC	**1**	0	1
8 MBC (only)	**3**	2	0
8 AND 7 MBC	**2**	2	-
8 - 6 MBC	**3**	2	1
8 MBC AND 6 MBC	**1**	0	1
7 MBC (only)	**7**	2	1
7 AND 6 MBC	**6**	6	0
7, 6 AND 5 MBC	**1**	1	0
6 MBC (only)	**7**	4	2

Table 10.3: Tier 3 sites: summary of clay object presence absence data. Sites with small geometric clay objects have been reported as being present (either by word of mouth, publication or site visits), sites where geometric clay objects or "tokens" are specifically stated as absent, and sites where a lack of clay objects in site reports and publications seems to represent a real absence of small clay objects seems almost definitely true; according to **(top)** geographical region and **(bottom)** millennia of occupation (in years calibrated BC). (See Appendix J for full information).

CHAPTER 11: CONCLUSION

11.1-THE RESEARCH TOPIC

The importance of the Neolithic period in the Near East is undisputed. Evidencing many of the worlds "firsts", the Neolithic provokes many questions related to why people made the change from a mobile hunting and gathering lifestyle into one of permanent, settled agricultural communities. Associated questions relate to the myriad of symbolic and ritual practices which emerged at this time, as well as household composition, social organisation and hierarchy, craft specialisation and inter-site relations (see Chapter 3.4). The appearance of a hitherto unknown artefact in the Near East, the small geometric clay object or so-called "token", and the timing of its emergence, corresponds with the start of the Neolithic and all its associated changes (Chapter 1). This suggests that these unassuming objects may have played an important role in Neolithic life, perhaps a symbolic one related to the so-called "cognitive revolution" (Watkins 2012: 23) which, it can be argued, accompanied the transition into the Neolithic period in the Near East (see Watkins in Chapter 2.4a-iv).

The abundance of clay objects, found across an expansive temporal and geographic zone (figure 10.12, table 10.3, Appendix J and map figure 4.1) and often in huge numbers at each site, implies an important role for these items, related to changes in lifestyle and culture seen at the start of the Neolithic. However, their often crude appearance and variation of form, both within (Chapters 6 to 9, Appendices B, C, D, F and H) and across sites (Chapter 10, Appendices A and I), coupled with their cryptic function, has made clay objects as an artefact category, hard to define and even more difficult to label. There are many similar and overlapping object categories they are often assigned to, such as "tokens", "counters", "geometrics", "figurines", "gaming pieces", "tallies", "misc." and so on (Chapters 2.2, 2.3 and 9.4). Furthermore, when found, clay objects have often been ignored altogether. Even in recent decades, little work has been invested into the recording and publishing of their numbers, form and context in the hope of understanding the role on-site. All of the above factors combined necessitate a modern and comprehensive review of the form and distribution of geometric clay objects in order to better understand their function and the reasons for their appearance in the Neolithic Near East.

Aside from the timing of the appearance of clay objects within the archaeological record of the Near East, corresponding with the appearance of the world's first agricultural villages, their potential importance is attested in the enduring nature of

small geometrics. Following on from the Neolithic period, objects of a similar appearance continue to be found at sites across the Near East into the 1st millennium cal. BC (Chapter 2.2 and figures 2.1, 2.3, 2.4, 2.33-2.3). Though their function in the Neolithic cannot be assumed to mirror that of later periods, from the late 4th millennium cal. BC onwards, it is clear that clay objects were used in the administration sphere alongside, but crucially not being replaced by, written records and hollow, spherical clay bullae (envelopes). They were used to aid in the administration of transactions and later archived as a record of economic activity. The integral role of clay objects in the accounting sphere, utilised in a similar fashion for over three millennia after the advent of writing, attests to their importance and efficiency within the domain of record-keeping, and more generally, within the villages, towns and cities of the ancient Near East. Non-written forms of record-keeping existed alongside writing in the Near East, exemplified by the simultaneous and collective use of seals, sealings, clay objects, bullae and cuneiform clay tablets for millennia. Similarly, in Medieval Europe, the widespread official use of tallies attests to the benefit of non-literate forms of communication and information storage, in a form which was easily learnt, understood, and thus assessable to many (Chapter 2.4c and figure 2.43).

With the integral role of geometric clay objects within recordkeeping undisputed for over three millennia in the Near East (4th to 1st) their significance as an artefact category in the Neolithic must be considered. The scarcity of serious clay object studies to date, along with assumptions based on one person's theory of the function of clay objects, support the need for a reconsideration of their function. Much improved excavation techniques (increased use of sieving and flotation, as well as the recognition of geometrics), and the large number of new excavations initiated into the Neolithic of the Near East since Schmandt-Besserat's main publication (1992a, 1992b), underpin the need for new research into the function of small geometric clay objects at the period of their appearance: the Neolithic.

11.2-COMMON ASSUMPTIONS OF NEOLITHIC "TOKENS"

As detailed in Chapter 2.3, a number of functional and interpretative assumptions have been placed on the small, geometric clay objects of the Neolithic Near East. Propelled by the work of Schmandt-Besserat (1992a, 1992b, 1996), and her (far more solid) interpretation of the function of similar objects in the 4th to 1st millennium BC, prehistorians have tended to either ignore clay objects, or broadly agree with Schmandt-Besserat's interpretation of them for the Neolithic period. Indeed, it is

commonly presumed by archaeologists (aside from the early historic community) and by scholars of related, secondary disciplines, that the role of Neolithic geometric clay objects was in the domain of accounting and recording. Though few academics actually discuss, or even speculate, which clay objects might have been used to account when recovered at sites, Schmandt-Besserat's notion of the timing of their appearance coinciding with the advent of agriculture-crops and animals being the obvious subjects of accounting (1996: 7, 99, 102) has received little opposition within archaeology or secondary disciplines. It is also widely assumed by archaeologists, and academics aside from those cuneiform specialists representing the early historic community (see Chapter 2.4aii) that clay objects held the same role across the entire Near Eastern region, and also that this role in the recording of agricultural related produce remained constant for the duration of the Neolithic period-a time frame of 4,000 to 5,000 years (Schmandt-Besserat: 1996: 102). Clay objects have been understood as having a singular role in the Neolithic Near East despite its substantial size (both temporal and geographic) and the variability evidenced in subsistence strategies, material culture and ritual practice, for example. Lastly, clay objects are seen (by Schmandt-Besserat, yet admittedly not all) as clear evidence of an interrelated symbolic system in the Neolithic Near East: part of a code, used and understood by all (1992a: 198). They are presented by many, as having a consistent function, surviving beyond the Neolithic, as the objects evolved into "complex tokens" (Schmandt-Besserat 1996: 7, 16-17, 102, 103, 1992a: 36, 37, 49), and eventually the symbols of early cuneiform script of the late 4th millennium (Schmandt-Besserat 1996a: 2, 142-90, 198).

This research has proved all of these basic assumptions to be incorrect. Though there is evidence to suggest clay objects were used to count and record in *some* instances, this evidence is far from widespread in the Neolithic. There is no evidence, aside from the timing of the appearance of clay objects and agriculture, that clay objects were used in, and *only* in the accounting of agricultural goods. The diversity of clay objects (as seen in Chapters 6 to 9 and Appendix A) and apparent fluidity of use supports this. In the complex, highly symbolic worlds of the Neolithic Near East, where "powerful new forms of symbolic representation in material form" (Watkins 2004: 103) existed, clay objects could have in some circles within some settlements, acted as mnemonic aids. Yet this idea is far from supporting Schmandt-Besserat's set symbolic theory where each shape and the markings on it represented a specific, and set commodity, constantly, and uniformly across all sites within the entire Near East for millennia.

If and when used in accounting, clay objects could have been used to keep track of all manner of things, including domestic animals and plants, but also hunted animals, wild gathered foods stuffs, raw materials, finished craft items, and tools. Aside from goods, clay objects could have been used in the recording of labour (related to agriculture, and other spheres such as craft manufacture), people (as part of population statistics in large settlements-useful for example, for assessing required food rations), units of land, and periods of time. The diversity of clay object appearance (both within and across sites), and the variety of clay object assemblage composition across sites, suggests a diversity of function, even within a singular functional category such as accounting. This is supported by Watkins' external symbolic storage theory (Watkins 2004, 2006a, 2010, 2012) (see Watkins in Chapter 2.4a-iv) where material culture was given a symbolic meaning, unrelated to it's appearance. This meaning could be changeable, and may have been understood and had meaning only when utilised as part of a group of objects (Watkins 2012: 36, Chapter 2.4a-iv). The archaeological, historical and ethnographic examples of non-literate accounting systems presented in Chapter 2.4c demonstrates the diverse range of things people need to account for, both in ancient and historical times.

The variability seen within settlements found of the Neolithic Near East (illustrated in Chapter 3.5), as well as the lack of correlation between sites 1) with and without clay objects and 2) the number of clay objects present, especially in relation to sites size and population estimates (figure 10.12, table 10.3 and Appendix J), is clear evidence against the assumption of small geometric clay objects holding the same function across the region in the Neolithic period. Likewise, the diversity in clay object assemblages is evidence against a singular role of clay objects within a single phase of the Neolithic, region of the Near East, and even within a single phase of a sites' occupational sequence. Diversity of clay object assemblages across sites, with no correlation to any site characteristics indicates a transient function and multiple use, even within a single site. Many changes are evidenced within the Neolithic period and there is little to suggest that against this backdrop, the use of clay objects would remain static. Indeed, the "complex tokens" of Schmandt-Besserat are present at some Neolithic sites, yet do not appear at others at all, going against the theory of the evolution of clay object complexity from the Neolithic into the 4th millennium BC. Lastly, the lack of continuity between sites, and the lack of a set clay object repertoire, even on a regional or temporal basis within the Neolithic Near East, is strong evidence against the existence

of a Near Eastern wide symbolic system related to the administration of agricultural goods, or any other commodities which may have been in circulation.

11.3-MAIN FINDINGS

The most important result of this research was the lack of evidence for a singular, consistent and united function of small geometric clay objects across the Neolithic Near East. There is little evidence for a singular and consistent function of clay objects within a single phase and area of settlement at Tell Sabi Abyad (aside from within level 6 of operation I), or across the occupations at Boncuklu Höyük and Çatalhöyük. There is even less evidence that, across these, the case-study sites, clay objects were utilised in the same way at each. This highlights the fluidity of function and transient nature of clay objects, supported by the fact they are readily disposed of, with replacements easily crafted when needed (as at 'Ain Ghazal, Boncuklu Höyük and Çatalhöyük, see Chapters 6, 7, 8 and 9.3). This is a notion supported by Watkins' assertion that many of the objects exchanged within Neolithic communities had a symbolic rather than intrinsic and utilitarian value (2012: 24). On a broader scale, an unexpected finding was the lack of correlation seen across the temporal and geographic span of the Neolithic Near East. Little relationship was seen in any variable studied, between the sites which did, and the sites which definitely did not have any, or had very small numbers (<10)of clay objects. Of the tier 3 data, equal numbers of sites had, and did not report to have, any clay objects at all. Clay object yielding and clay object lacking sites came from all regions and time periods (table 10.3).

In character, sites with clay objects represent a diverse group, in terms of site size, the style of architecture evidenced, the presence or absence of storage facilities, and when present, the location, form and capacity of such facilities for example. Diversity within these sites is also attested in the presence/absence of pottery and other types of material culture, along with the range of imported raw materials present. Sites *with* clay objects include typical Neolithic farming villages, but also those interpreted as ritual, non-residential sites, along with settlements displaying only very short occupational time frames. Varied subsistence strategies are also represented in the sites with clay objects: fully agricultural, hunter-cultivators (i.e. Suberde), those based on hunting and gathering (Hallan Çemi), and all combinations of the above. The only possible correlation evidenced in this sphere was the lack of clay objects being reported at sites lacking evidence of both animal and plant domestication along with a lack of fully permanent, residential structures (Appendix J).

Within the sites which do exhibit small geometric objects, a distinct absence of a standard clay object assemblage was seen. The number of clay objects per site ranged from as little as 2 or 3 (e.g. Domuztepe, Aşıklı Höyük, Gesher, Tell Hemmeh), into the hundreds and thousands (e.g. Boncuklu Höyük, Tell Sabi Abyad, Çatalhöyük, Kfar HaHoresh, Sha'ar Hagolan, Jarmo). No patterning is seen between the number of clay objects, the size of site, time period of settlement, duration of settlement or location of site (taking into account factors such as retrieval strategies, the proportion of a site excavated for example). Though a standard range of three-dimensional shapes are represented across the clay objects of the Neolithic Near East, within individual sites, the variety and proportion of different shapes varies greatly, with an overarching inconsistency being the main characteristic. This complete lack of correlation was not expected. Rather than supporting the notion of a united function of clay objects in the Neolithic Near East, and furthermore their operation as part of a unified symbolic system, the evidence points to the reverse.

Though thoroughly investigated with consideration to many factors (including excavation and post processing techniques, project aims, project director and time period in which the site was excavated, the duration of an excavation project, area and depth excavated), the identification of Neolithic sites almost certainly lacking clay objects was extremely difficult to assess with any certainty. At only a very small number of sites, those where despite the use of flotation and/or sieving, the excavation of a significant volume of soil and proportion of the site, the retention and recording of all small finds and cultural materials, even those of unknown function and crude appearance and sites where the excavators have confirmed an absence of possible or potential geometric clay objects, can the likely absence of clay objects be claimed. Yet even for these sites, non-clay but comparable, small, geometric-shaped objects may have been used in the same, or similar way to that of their clay counterparts; pot sherd discs, large seeds or nuts for example. This difficulty in the secure identification of clay object-lacking sites, and sites where clay objects were possibly substituted for comparable objects, further compounds problems with the identification of particular features and patterns in the distribution and composition of sites across the Neolithic Near East *with* and *without* clay objects or associated tools.

11.4-HOW WERE CLAY OBJECTS USED IN THE NEOLITHIC?

Small geometric clay objects were multifunctional in the Neolithic Near East. The objects held varied roles within the communities of this large region and time period,

and even within single sites. The utilisation of clay objects in counting, simple record keeping, gaming and ritual (including divination and the casting of lots in decision making, see discussion of each in Chapter 2) are all equally persuasive options for the Neolithic period. Though clearly and exclusively used in the administrate sphere in the 4th to 1st millennium, there is no archaeological evidence to suggest that record keeping was the primary or sole function of Neolithic clay objects, nor that they had a mnemonic function in these early times.

(i) Tell Sabi Abyad

At Tell Sabi Abyad, the function of geometrics is clear in some phases of settlement, yet remains less certain at others. The level 6 Burnt Village of operation I (along with operation II) demonstrates undisputable evidence of the use of clay objects within the administration of goods stored within the village, functioning alongside seals and sealings as part of a well organised and complex system. However, despite the broad expanse of level 6 settlement revealed, and the excellent preservation of a wealth of *in situ* evidence, many questions remain unanswered; who the stored goods belonged to, whether the seal impressions relate to groups or individuals, and their exact meaning, if the goods were sealed by those acquiring the sealed goods or parting with them, and the reason for secure, communal storage rather than individual facilities within the domestic space for example? Indeed, what was being stored in these units and sealed containers is still unknown. Therefore, if as evidenced at Sabi Abyad, clay objects were at times, used in administrative activities, exactly how this administration functioned remains unclear.

The role of clay objects within the village of V6, operation II at Tell Sabi Abyad is similar, though not identical, to that of operation I. The addition of bullae into the archives of this village area, alongside sealings, storage vessels and geometrics, as well as the homogenous appearance of at least the clay objects sealed inside the bullae of V6, all suggest a different system was in operation here. The presence of a burial inside the burnt building, alongside the ritual and intentional fire which preserved the building, its bullae and clay objects *in situ,* merge the boundaries of administration and ritual activity. The function of clay objects in other phases and areas of Tell Sabi Abyad, and their relationship to other artefact categories such as sling missiles and figurines, is still uncertain. As is the meaning of the more distinctive objects, those represented by single examples only (i.e. the "tally", "gaming piece? Token" and the stone cube), and the homogenous "sets" (the miniature vessels and "anthropomorphic cones" for

example). The distinct similarity in shape, craft and decoration of the latter category surely has symbolic meaning, a meaning beyond the purely decorative. As Watkins' (2006b, 2010, 2012) work suggests, Neolithic people were clearly capable of utilising sets of objects, recursively, in order to transmit language, data and abstract concepts (Chapter 2.4a-iv). Yet how this was done may never be known, especially as it seems likely this was undertaken differently at different times and different areas of a single site, at least across settlements of the Near East region.

(ii) Çatalhöyük

The fact that Çatalhöyük's clay object assemblage is united by many shared characteristics in terms of appearance, craft and fabric, does not automatically mean each piece functioned in the same way, or as part of a single system. The common deposition of many of the "mini ball" spherical objects in larger clusters of other identical objects, and in contexts distinct from all other small geometrics at Çatalhöyük, is clear evidence for their utilisation together, performing the same function. The caching of identical spheres together, and to the exclusion of other items, in distinctive location under the floors of domestic buildings is strong evidence for their use in counting, and the simple administration of commodities, agricultural supplies foodstuffs, even the tracking of units of time related to agricultural supplies stored, or calendrical events relevant to farming, at a household level (see Chapter 5.6a for discussion of a Neolithic administrative context).

The role of other clay objects at Çatalhöyük, including the other forms of sphere, is less clear. They are just as likely to have been utilised in counts, as they were in gaming or ritual activities. The common midden context of most hints at their use inside the home, yet this disposable nature of clay objects at Çatalhöyük, alongside their crude form, ease of craft, and the fact they are made from a most ubiquitous raw material, demonstrates their value was not intrinsic, but imbued upon them. In this light, the role of artefacts may be transient, with one set of objects performing multiple roles within one use group, household or community. The distinct and homogeneous "squat cylindrical" pieces may have served an entirely different function (operating independently or perhaps as a group) to the cones, and objects grouped by other similarities, despite the fact that all clay objects are uniform in many aspects. In the same vein, sets of identical objects may have served multiple functions within Çatalhöyük, being used in a different way across different phases of occupation, areas of the site or within contemporary, neighbouring households. The remarkable level of

archaeological preservation seen at Çatalhöyük and the lack of any hint of gaming boards of any kind, lessens the plausibility of gaming as a functional option here. However, as discussed in Chapter 2.3b, gaming most commonly utilises boards, yet not exclusively so.

(iii) Boncuklu Höyük

In comparison to other small finds at the site, geometric clay objects are abundant at Boncuklu Höyük, yet the presence of other much more highly crafted items highlights the very basic nature of the production of geometric clay object assemblage. Like Çatalhöyük, this simple nature may have allowed the objects to hold multiple changing symbolic meanings and practical functions, fluid and ad-hoc in nature. It seems plausible that the objects at Boncuklu may have been used as simple counting aids, yet a single, overarching function may not fit the diversity of these artefacts. In fact multiple roles, including their use in gaming, divination and the casting or drawing of lots, as well as for simple counting, all seem plausible at Boncuklu. The presence of clay objects in abundance contrasts with the small size of the site, its simple, organic layout, the lack of direct evidence of large scale storage, yet as seen in Chapters 2 and 4.1, more modest to medium storage capacity could easily be provided by use of baskets, a container which Boncuklu does have abundant evidence for. All of this might suggest a limited need for counting and accounting, especially in contrast to the characteristics seen at contemporary levels of Aşıklı Höyük, where there is a much more convincing need for counting and accounting, but where these objects are largely absent.

The lack of distinct distinguishable sets of objects at Boncuklu may therefore represent the beginnings of a simple monitoring of transactions, reflected in the less regimented, less clear, less distinct and well-defined range of objects present compared to classic later period clay object sets. Therefore, in some ways, the objects, whether used for counting, lots or divination and/or gaming, suggest quite complex social transactions might be carried out by the earliest small scale agricultural societies even where evidence for social differentiation is muted. The objects from Çatalhöyük are similar in many ways suggesting some continuity in object use. However, at Çatalhöyük distinct sets (present in small numbers) of near identical objects are present. Its sheer size along with other characteristics, suggests society at Neolithic Çatalhöyük was complex and multi-faceted, and therefore the objects may have been used here in a more complex manner. However, the Aşıklı evidence does not fit into this scenario.

Chapter 3 discusses many of the major developments of the Neolithic period, so how does this study add to our understanding of the Neolithic? The timing of the appearance of clay objects at settlements at the start of the period does correspond with the appearance of agriculture, yet the two are not dependant on one another. The start of the Neolithic also evidence the appearance of a spectrum of economic social and perhaps even cognitive (Watkins 2004: 105; Watkins 2006a: 76; Watkins 2006b: 20-21: Watkins 2010: 621; Watkins 2012: 23, 36, 38). As seen from the studied examples (Chapters 6 to 10), evidence does not always suggest the use of clay objects in the economic sphere. Their use in accounting when hinted art, seems to be related to the increasing range of materials, commodities and foodstuffs in circulation rather than the presence of agriculture alone, and clay objects could have been utilised in the counting and accounting of things outside of the realm of agriculture and its related activities. Many people have commented on the fluorescence of symbolism within the Neolithic of the Near East. The period certainly does see a renewed focus on symbolic practice, including identity marking through ritual activity, personal identity expression and the importance of the creation and maintaining of communal identity through a mosaic of systems of symbolic representation utilising material culture, mortuary remains, architecture, costume and performance (Watkins in Chapters 2.4a-iv, 3.8, 4.1d and 4.2e). In this context, the fluid system of use of the small clay objects, as well as related and overlapping artefact categories (as seen at Çatalhöyük in the figurines and "mini balls"-Chapter 7, Chapter 10.2(iii-iv), 10.4a and Appendix D, and the "anthropomorphic cones" of Tell Sabi Abyad for example-Chapter 8.2b) adds to the understanding of the importance of the symbolic aspect of Neolithic life. The use of clay objects likely adapted according to changing interpretations of their meaning. Schematic cones may have been imagined as representing humans, and used as figurines for ritual activity at one point in time, yet the same objects would also have been capable as being used as geometric objects; as counters for gaming, for counting, or as tokens in accounting and recording. Symbolic representation in material form did not have limitations on what could be expressed, or how regularly symbolic meaning could be changed and re-applied (Watkins Chapter 2.4a-iv).

(iv) Future directions

Based on the work completed, how could this research topic be advanced? The recognition, active retrieval and detailed recording of clay objects in a format comparable to that of this study will provide further data sets to be investigated in order to enhance the understanding of specific sites, and add to the overall

understanding of life in the Neolithic. Further work encompassing a much larger number of objects and concentrating on the presence and distribution of objects from within specific spaces, buildings and neighbourhoods, and across different phases of occupation may reveal telling information about the role of the objects within the community at Boncuklu Höyük, Çatalhöyük, Tell Sabi Abyad and other sites.

The fingerprint study currently being undertaken by Lori Hager (Chapter 6.4) hopes to provide information crucial to the understanding of clay objects, and a future collaboration project. The pilot study on 15 clay objects from Boncuklu has yielded a good level of detectable and measurable prints (good to excellent prints seen on 40% and faint prints on 30% of the sample), and suggests clay object production at Boncuklu was dominated by adult females (Lori Hager, pers. comm.). The reliability of this data will be increased with a larger sample size gathered in the 2014 excavation season. Similar work at other sites will enable the Boncuklu results to be compared to sites across the region, to learn if the same people made clay objects at all sites. Likewise, a larger sample size may allow the identification of specific identities, and an assessment of how many people made how many clay objects per site; in turn revealing whether clay object manufacture was limited to a certain number of people within settlements. Also, contextualising the identities of clay object makers could help to reveal if their production was linked to specific economic, social or other roles.

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APPENDICES

APPENDIX B: BONCUKLU HÖYÜK ANALYSIS

Additional illustrations from analysis of the Boncuklu Höyük clay object assemblage (Chapter 6) are presented below.

FIGURES

Figure A.B-1: Examples of small, geometric shaped clay objects from Boncuklu Höyük: **(top)** left to right CO#s1515, 1483. **(Bottom)** CO# 1440 (front and reverse). (Photographs: author's own).

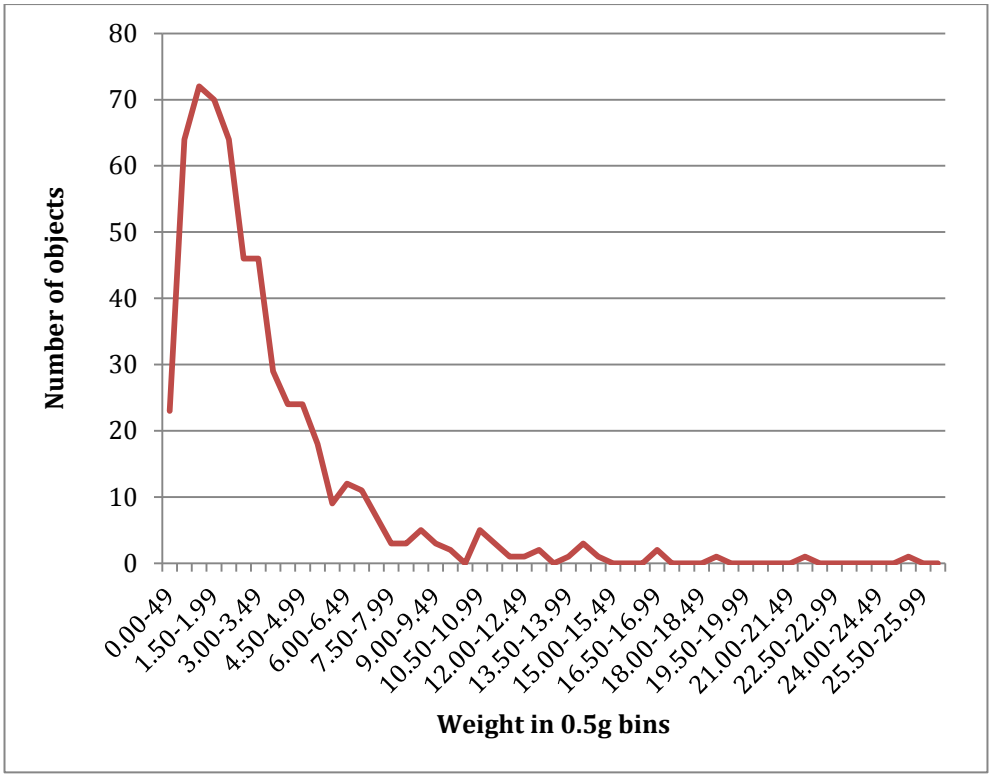


Figure A.B-2: Weight of Boncuklu objects in 0.5g bins.

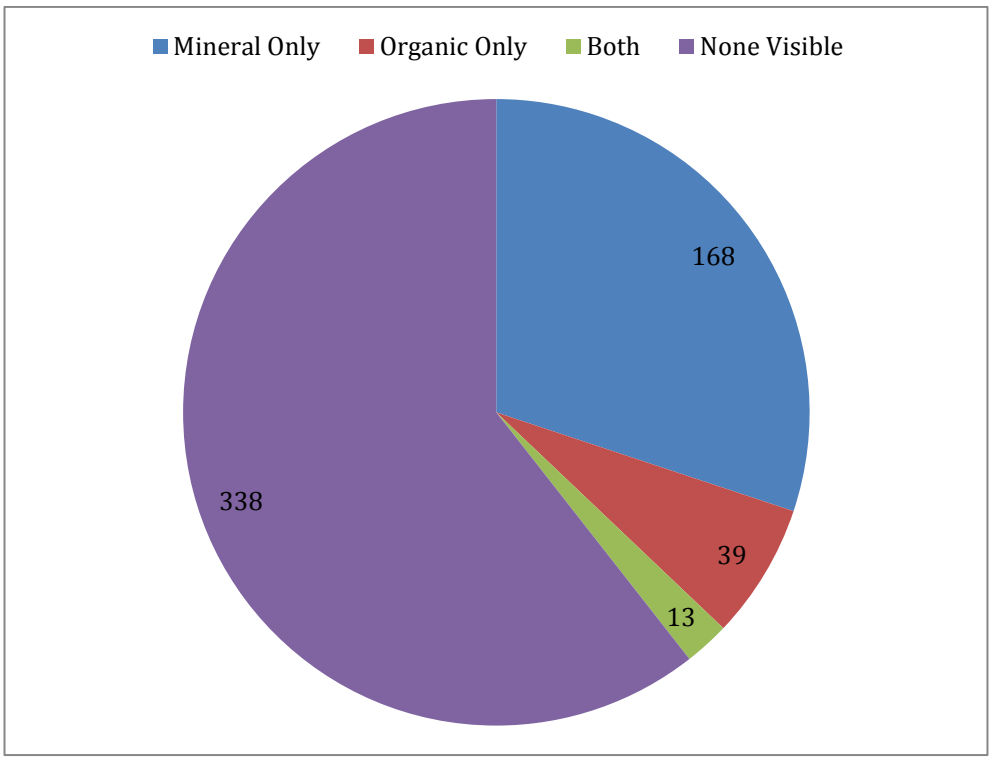


Figure A.B-3: Inclusions: the presence of mineral, organic or both types across all recorded objects (the number represents the number of objects with each inclusion type/combination).

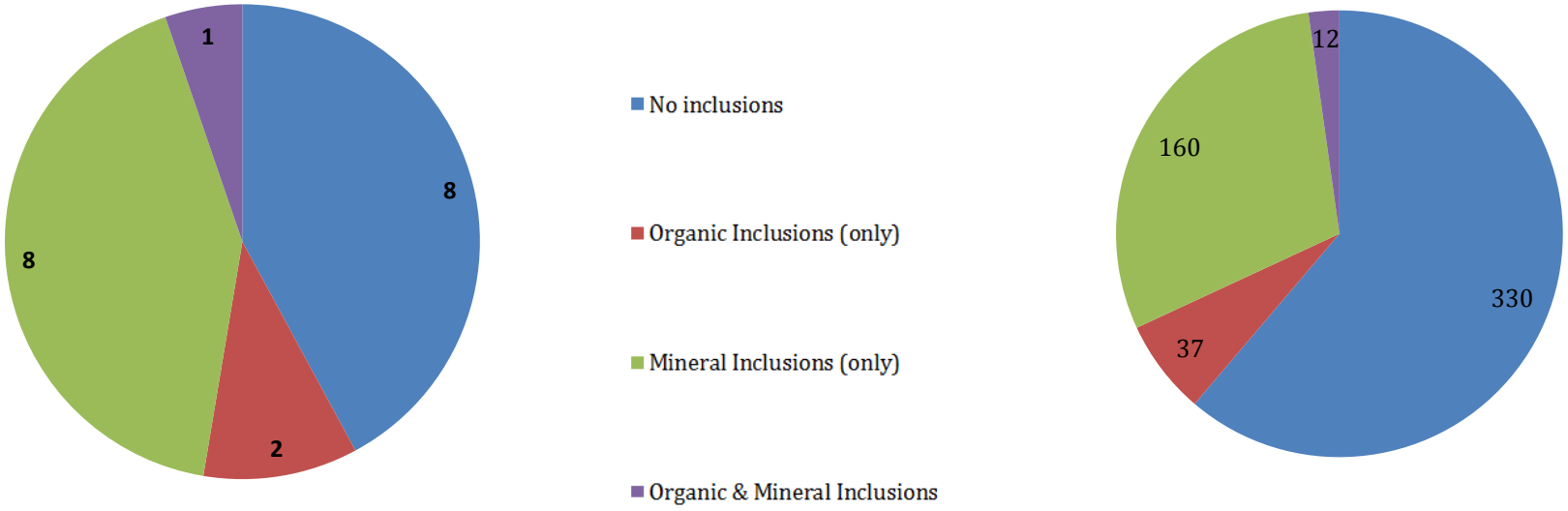


Figure A.B-4: Comparison of the number and proportion of inclusions within the coarse (left) and fine (right) textured objects.

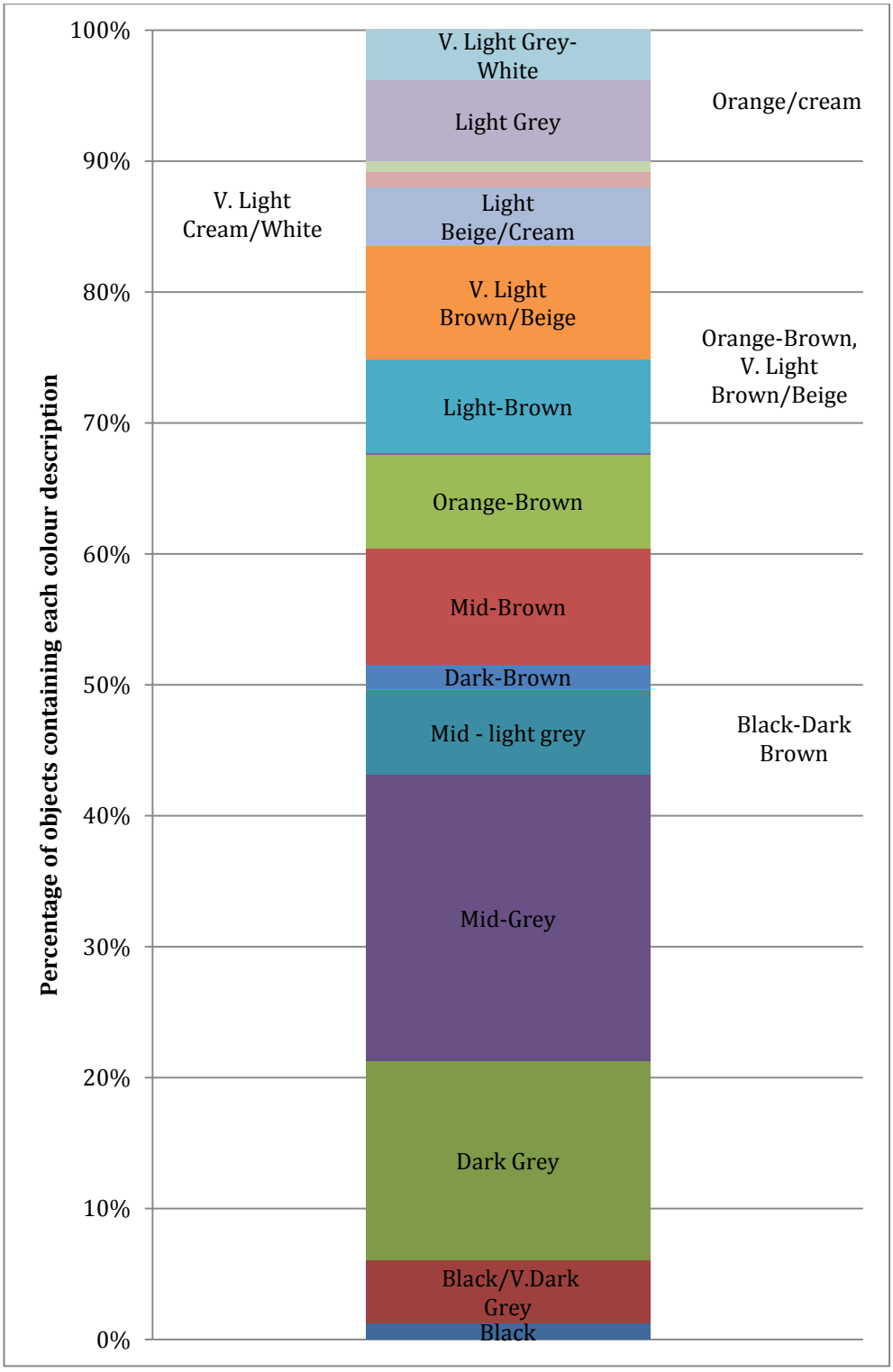


Figure A.B-5: Range of clay colours represented within the Boncuklu Höyük assemblage.

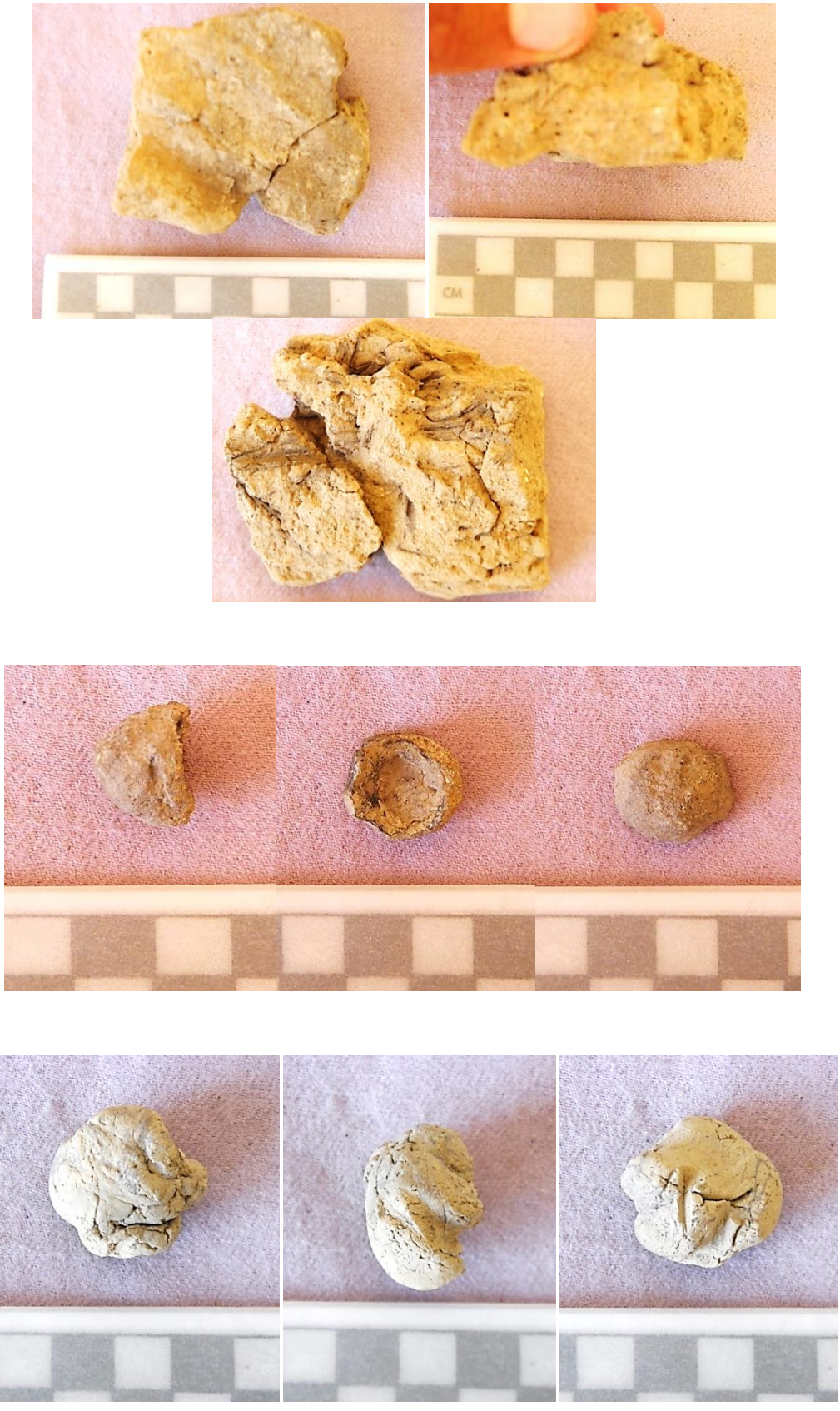


Figure A.B-6: Examples of a probable/possible sealings. **(Top)** CO# 727, **(middle)** CO# 22, **(bottom)** CO# 855. (Photographs: author's own).

Figure A.B-7: Example of "marked" objects. **(Top)** CO# 666. **(Bottom)** CO# 825 (front and reverse). Photographs: author's own).

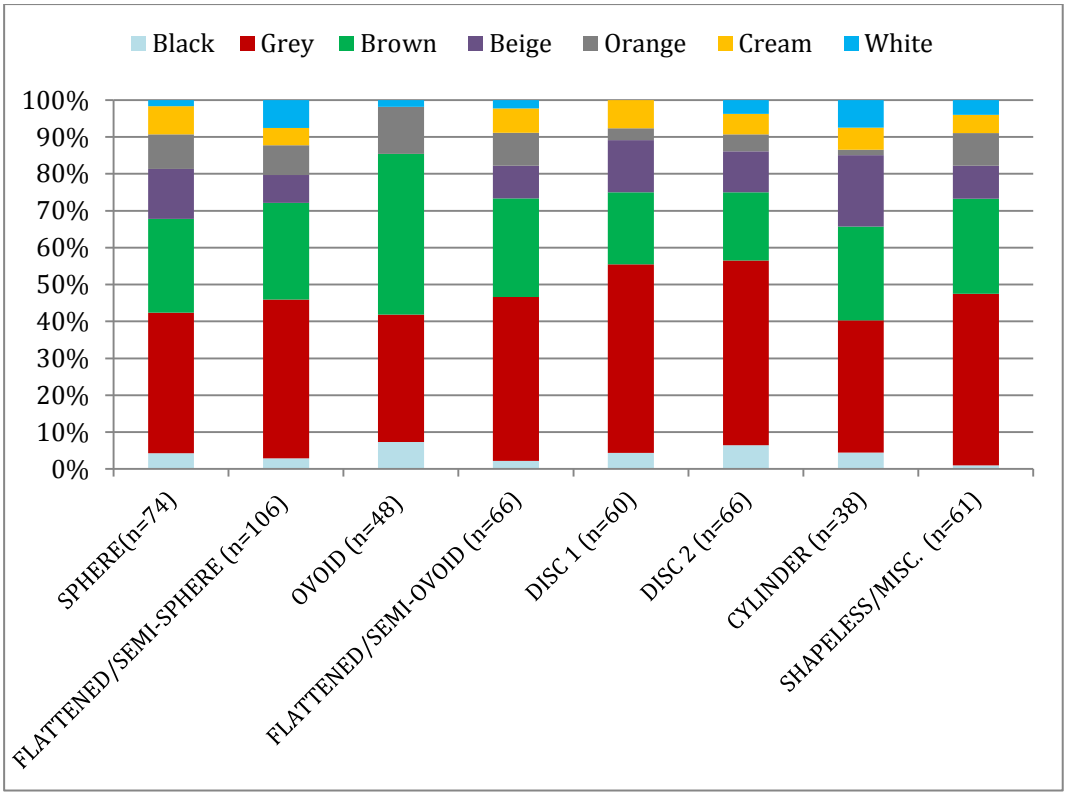


Figure A.B-8: Three-dimensional shape and colour-presence of the main colour shades as a proportion of each three-dimensional shape/sub-shape (the most abundant shapes and sub-shapes only).

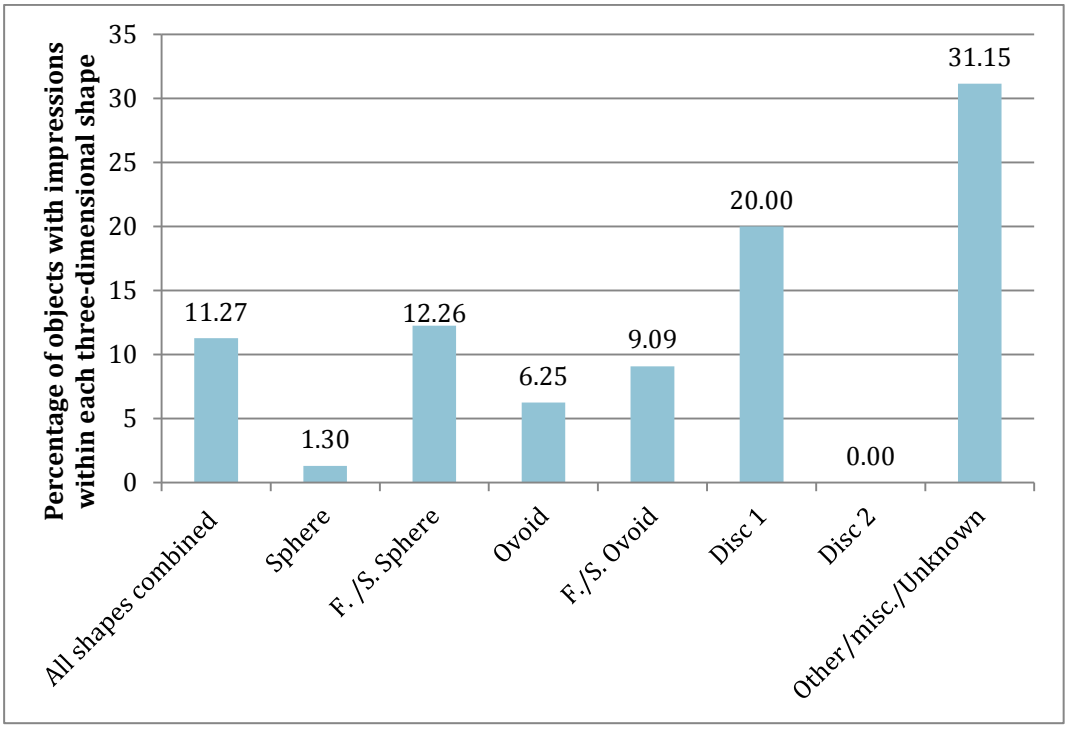


Figure A.B-9: Three-dimensional shape and the presence/absence of incidental impressions; detailing the proportion of objects within each of the most common three-dimensional shapes to display probable or definite impressions.

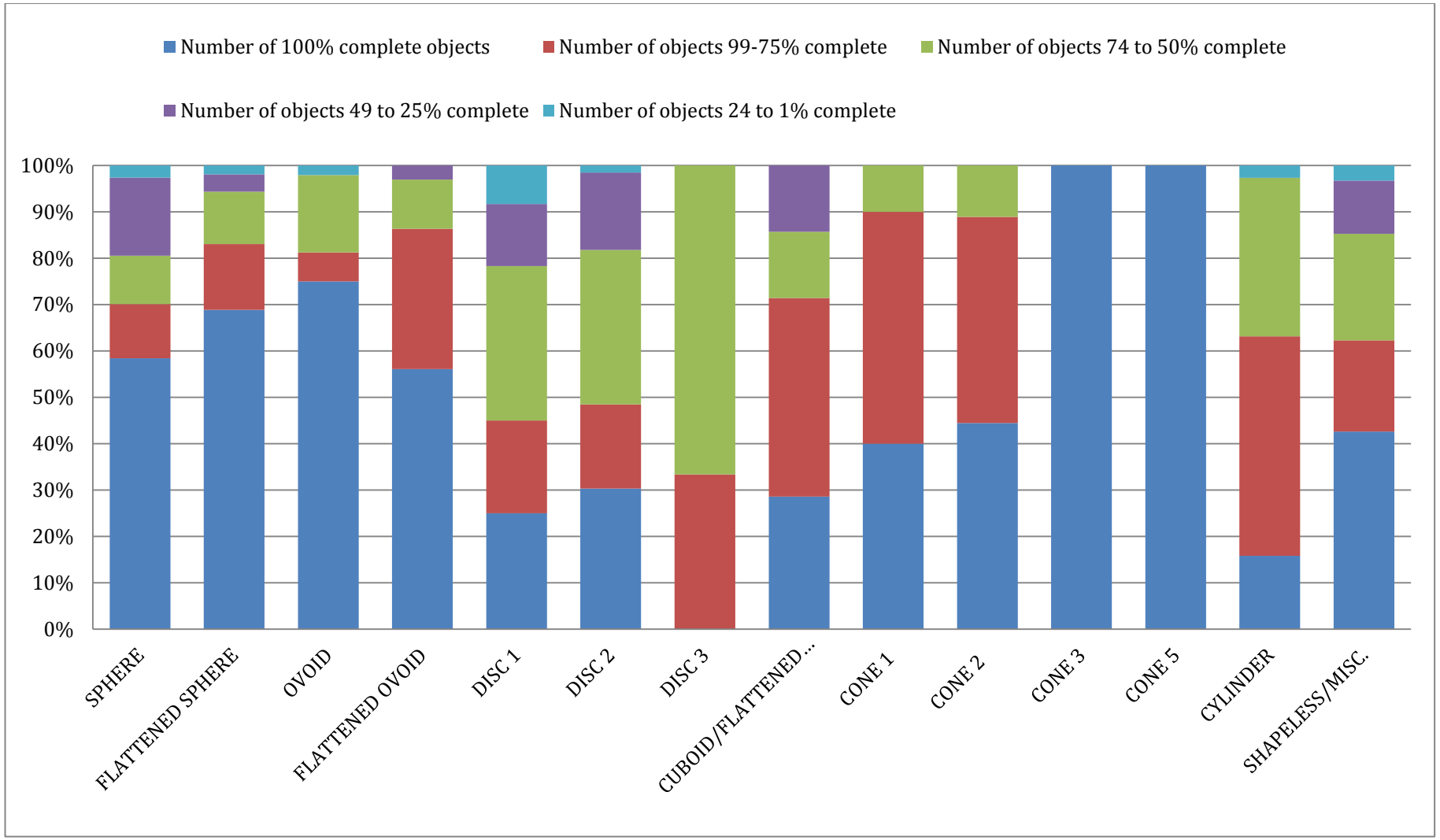


Figure A.B-10: Degree of completeness/fragmentation of objects according to three-dimensional shape.

TABLES

DIMENSIONS (CM)	MIN	MAX	AVERAGE
Length	0.70	10	2.04
Width	0.45	5.2	1.61
Height/thickness	0.30	9.5	1.10

Table A.B-1: Average object size recorded in three-dimensions, recorded in centimetres.

BASIC COLOUR SHADES (pure colour only, or description containing this colour)	**NUMBER OF BONCUKLU OBJECTS**	**PERCENTAGE OF BONCUKLU OBJECTS** (containing this colour in their description)
Mid-Grey	159	28.55
Dark Grey	127	22.80
Light Grey / V. Light Grey	119	21.36
Light Brown/ V. Light Brown	115	20.65
Beige	96	17.24
Orange	58	10.41
Cream	46	8.26
White	37	6.64
Black	34	6.10
D. Brown	14	2.51

Table A.B-2: The main basic colours along with the number of percentage of objects displaying each, in the Boncuklu Höyük collection.

CRAFT	APPLIED?	SEALING?	ADDITIONAL COMMENTS	THREE-DIMENSIONAL SHAPE	WEIGHT (G)	LENGTH (CM)	WIDTH (CM)	HEIGHT/THICKNESS (CM)	CO#	CONTEXT CODE	COMPLETENESS, (%)
Moulded/sculpted, rolled	Vessel (possibly), rope/string (possibly), stone vessel (possibly), unidentified item (definitely)	Definitely	Almost definitely a sealing: a flat piece of clay which has been curved as if attached to the rim of a vessel or around a cylindrical shaped object such as a thick string/rope. The resulting shape is a "u" shaped object. The inside of the shape is smooth	Shapeless/too frag./other shape	3.20	2.00	1.80	1.25	866	KAE	100%
Applied-2/3d object, moulded/sculpted, rolled	Basketry (possibly), leather bag (possibly), stone vessel (possibly), unidentified item (definitely)	Definitely	The object appears to be almost certainly a sealing. Only half of the object is present. The top surface is convex, the base is concave. The top surface has finger tip depressions where it has been pressed onto and compacted.	Shapeless/too frag./other shape	4.90	3.40	2.10	1.00	810	HID	50 to 74%
Applied-2/3d object, moulded/sculpted, rolled	Other	Definitely	The object has been applied to a 3d object-either the rim of a vessel or a thicker rope or string. The shape is spherical with a flat base into which a cylindrical shaped cut has been made (in the side/base surface	Shapeless/too frag./other shape	2.70	1.70	1.60	1.15	788	MFI	100%
Applied-2/3d object, moulded/sculpted	Leather bag (possibly), rope/string (possibly), unidentified item (definitely)	Definitely	Almost certainly a sealing. Fragmented-50-75% of the original object is present. The remaining object appears to have originally been a flatter piece of clay that was wrapped around an opening as the clay curved around and joins at the other side when vie	Shapeless/too frag./other shape	6.50	2.70	2.20	1.40	777	MFI	50 to 74%
Applied-2/3d object, moulded/sculpted, rolled	Unidentified item (definitely)	Definitely	Almost definite example of a sealing. Unfortunately the object is unfired, the clay is smooth, silty and eroded and therefore no impressions remain on the inner, curved, concave surface. The outer, top surfaces is curved (convex) giving the shape a semi-sp	Shapeless/too frag./other shape	2.10	1.70	1.70	1.10	760	MBW	100%

Table A.B-3: Detail of the characteristics of the 5 objects recorded as likely “definite” sealings.

CO#	SF#	CONTEXT CODE	MARKINGS: % OF OBJECT COVERAGE	MARKINGS: BASIC FORM	MARKINGS: QUANTITY	MARKINGS: DESCRIPTION	MARKINGS: TOTAL COUNT	CLAY COLOUR	THREE-DIMENSIONAL SHAPE	WEIGHT (G)	LENGTH (CM)	WIDTH (CM)	HEIGHT/THICKNESS (CM)
871	1,186	HNG	25 to 49%	Type 2: straight parallel lines	Type 2: 1 group	Two deep depression run the length of the top surface in parallel.	2	Mid-light grey	Flattened/semi-ovoid	2.30	2.00	1.60	1.10
1,465	1,413	MDM	25 to 49%	Type 2: straight parallel lines	Type 2: 1 group	Two deep grooves are seen on the base.	2	V. Light brown/beige	Ovoid	1.80	1.60	1.45	1.10
1,508	1,330	ZQE	25 to 49%	Type 2: straight parallel lines	Type 2: 1 group	Two deep, incised linear markings stretch the length of the top surface.	2	Mid-grey	Flattened/semi-sphere	1.60	1.70	1.60	0.70

Table A.B-4: Objects displaying similar markings, size, colour and shape. Left to right CO#s 871, 1465, 1508.

BUILDING NUMBER	AREA	CLAY OBJECT TOTAL COUNT	MOST COMMON BROAD THREE-DIMENSIONAL SHAPES				OTHER SHAPES (COMBINED COUNT)
			SPHERES	OVOIDS	DISCS	THREE MOST COMMON SHAPES COMBINED, AS A PERCENTAGE (OF EACH BUILDING'S TOTAL CLAY OBJECT COUNT)	
B. 1	K	16	4	1	3	50.00	8
B. 2	K	6	5	0	0	83.33	1
B. 3	K	3	0	1	2	100.00	0
B. 4	H	11	3	2	3	72.73	3
B. 5	H	20	6	6	3	75.00	5
B. 6	N	60	15	7	23	75.00	15
B. 7	K	2	0	2	0	100.00	0
B. 9	K	10	3	4	1	80.00	2
B. 10	N	3	2	0	1	100.00	0
ALL CLAY OBJECTS	**ALL**	**559**	**183**	**114**	**129**	**76.21**	**133**

Table A.B-5: Distribution of the three most common (within the Boncuklu Höyük assemblege) broad three-dimensional shapes wiithin each building at Boncuklu Höyük, compared to all objects combined.

APPENDIX C: ÇATALHÖYÜK ANALYSIS

Additional illustrations from analysis of Çatalhöyük clay object assemblage (Chapter 7) are presented below.

FIGURES

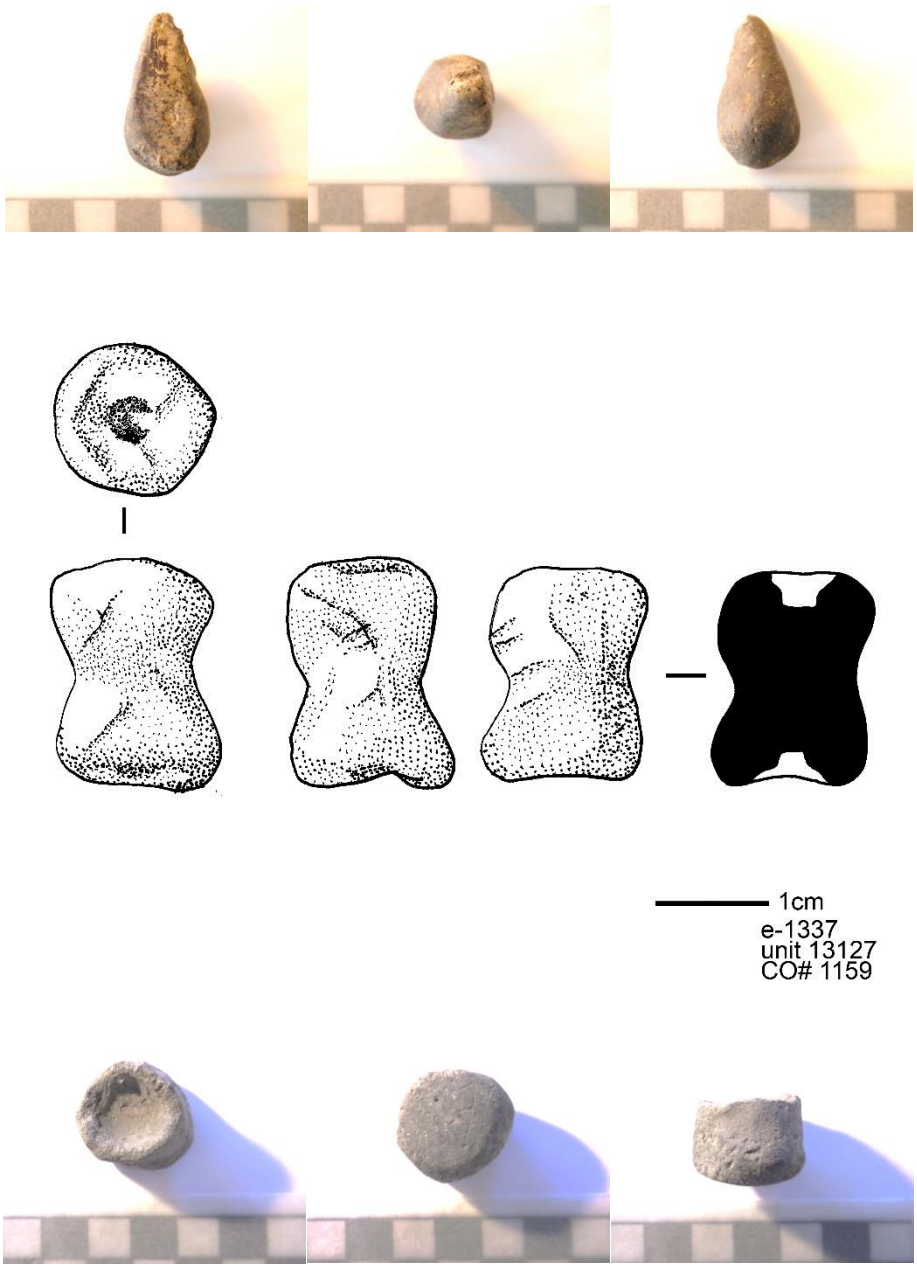


Figure A.C-1: Notable and unusual object shapes represented by the Çatalhöyük (recorded as "misc." or "other"). **(Top)** CO# 416, **(middle)** CO# 1159 and **(bottom)** CO# 1243. (Photographs: author's own, drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

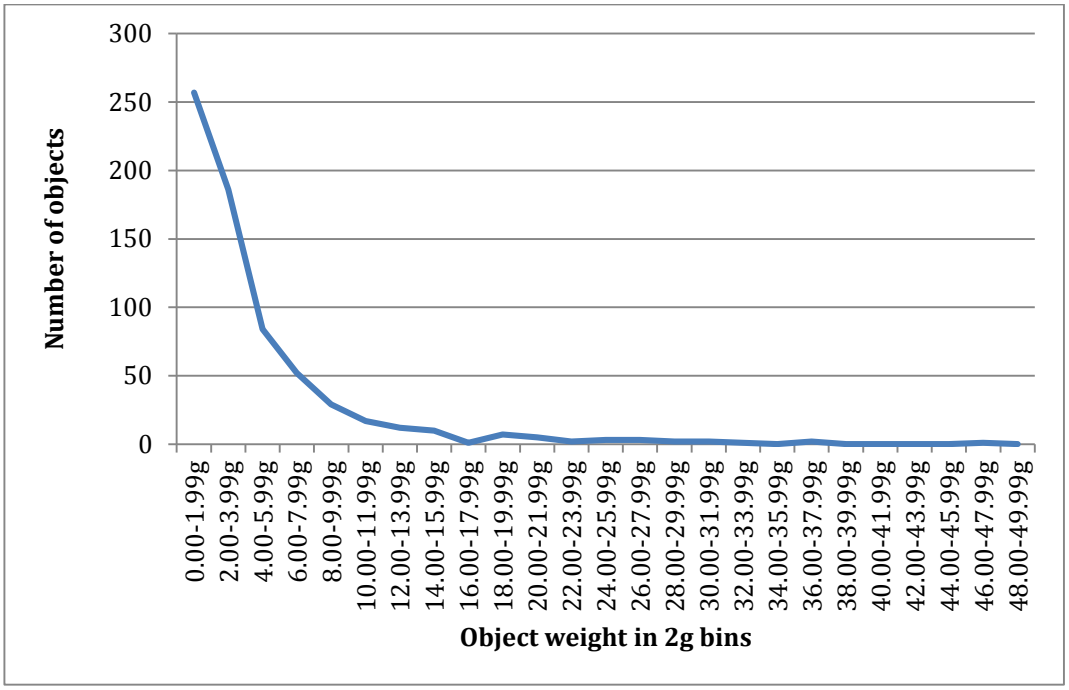


Figure A.C-2: Clay object weight in two gram steps.

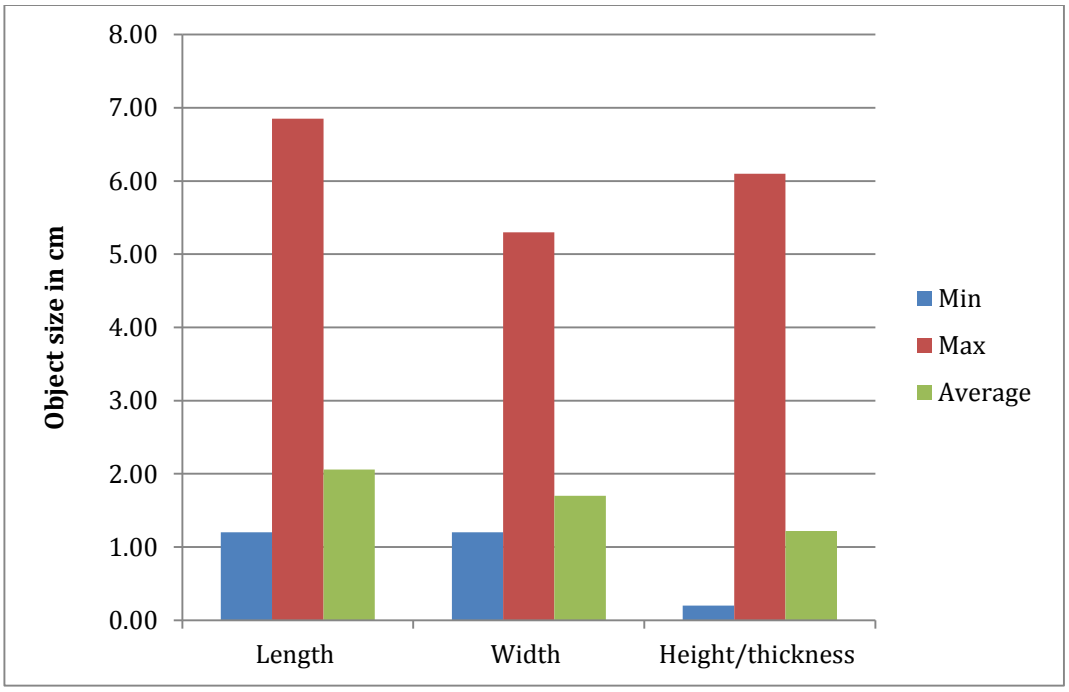


Figure A.C-3: Minimum, maximum and average dimension of objects (in centimetres), as measured from three angles: length, width (in plan view) and height/thickness (in section view).

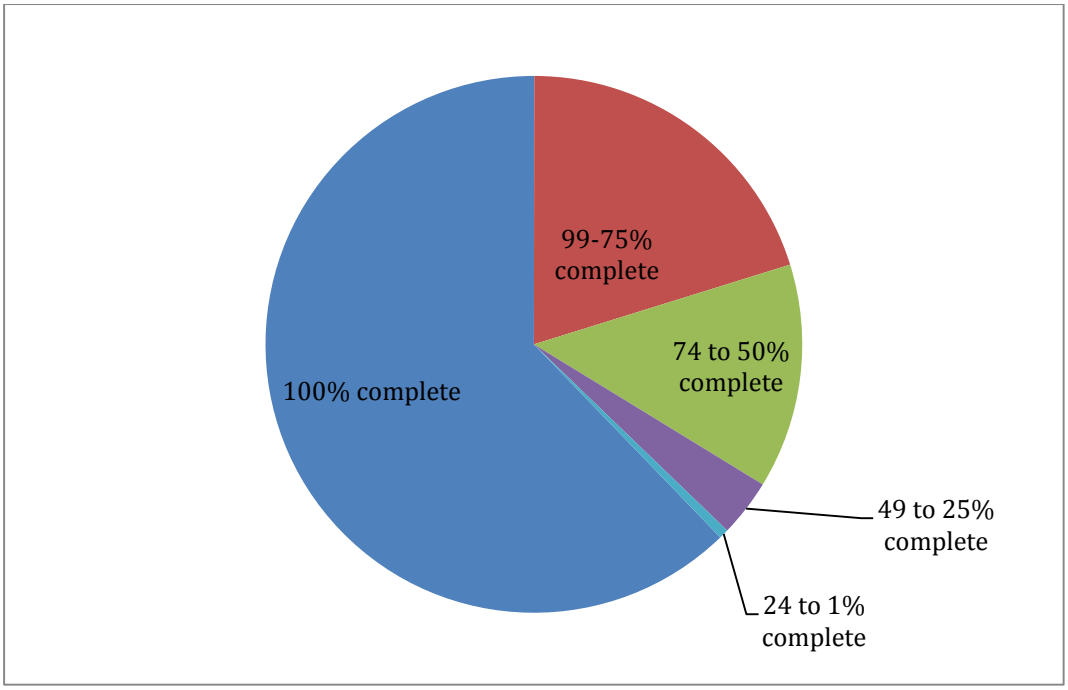


Figure A.C-4: Fragmentation chart detailing the degree of damage of fragmentation within the recorded Çatalhöyük assemblage.

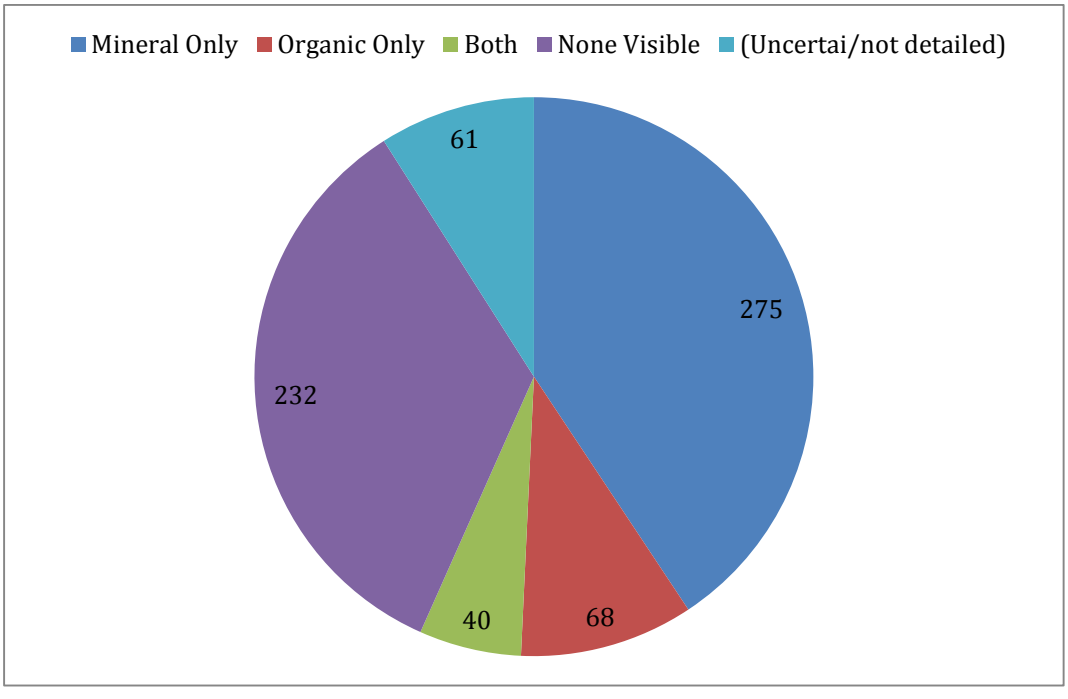


Figure A.C-5: Basic range of inclusions within the assemblage, as identified with a hand lens. The number of objects containing each organic and mineral inclusion type is recorded.

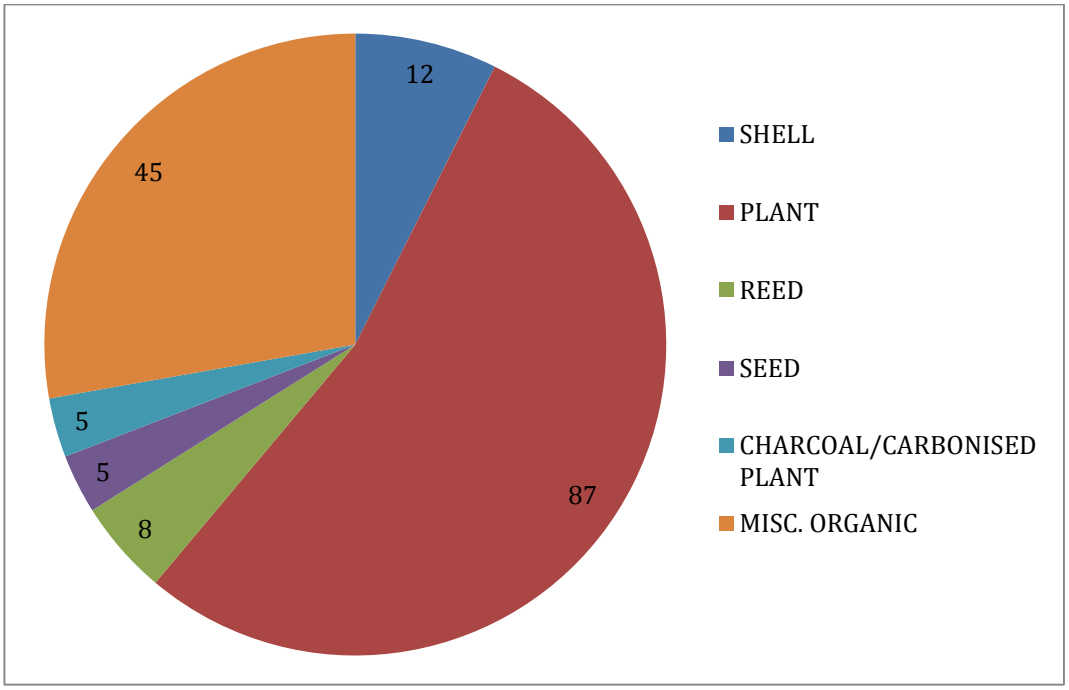


Figure A.C-6: The range and number of organic inclusions seen with a hand lens in the studied Çatalhöyük clay objects.

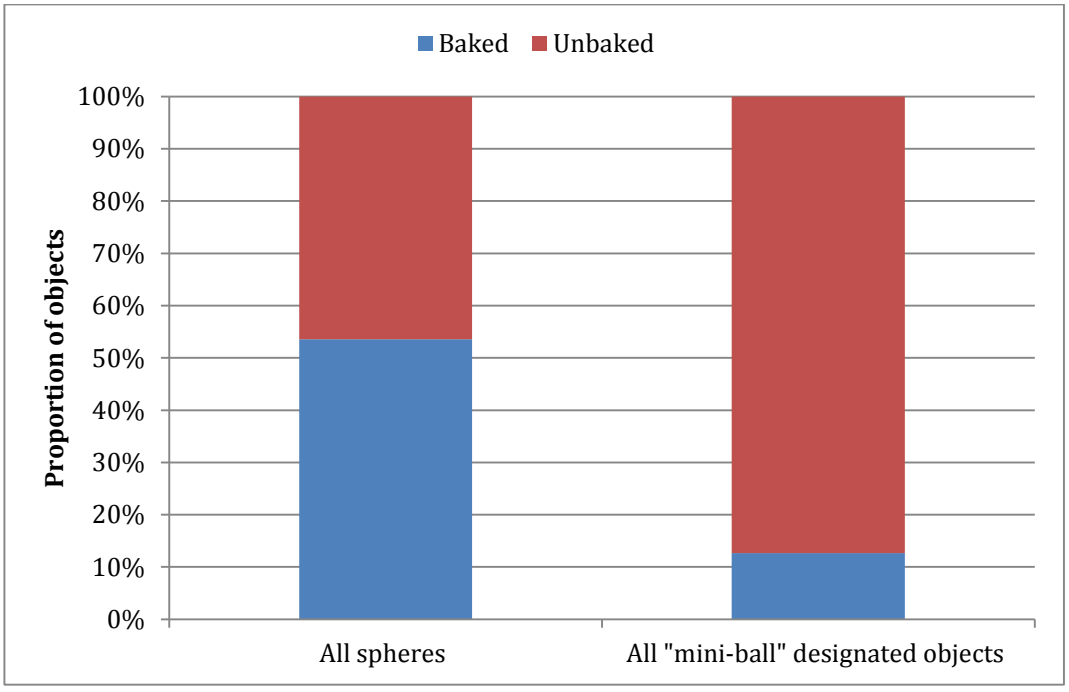


Figure A.C-7: Detail of the relative proportion of baked and unbaked objects within all "spheres" (n=149) compared to objects classified on-site by Çatalhöyük as "mini" balls (n=72).

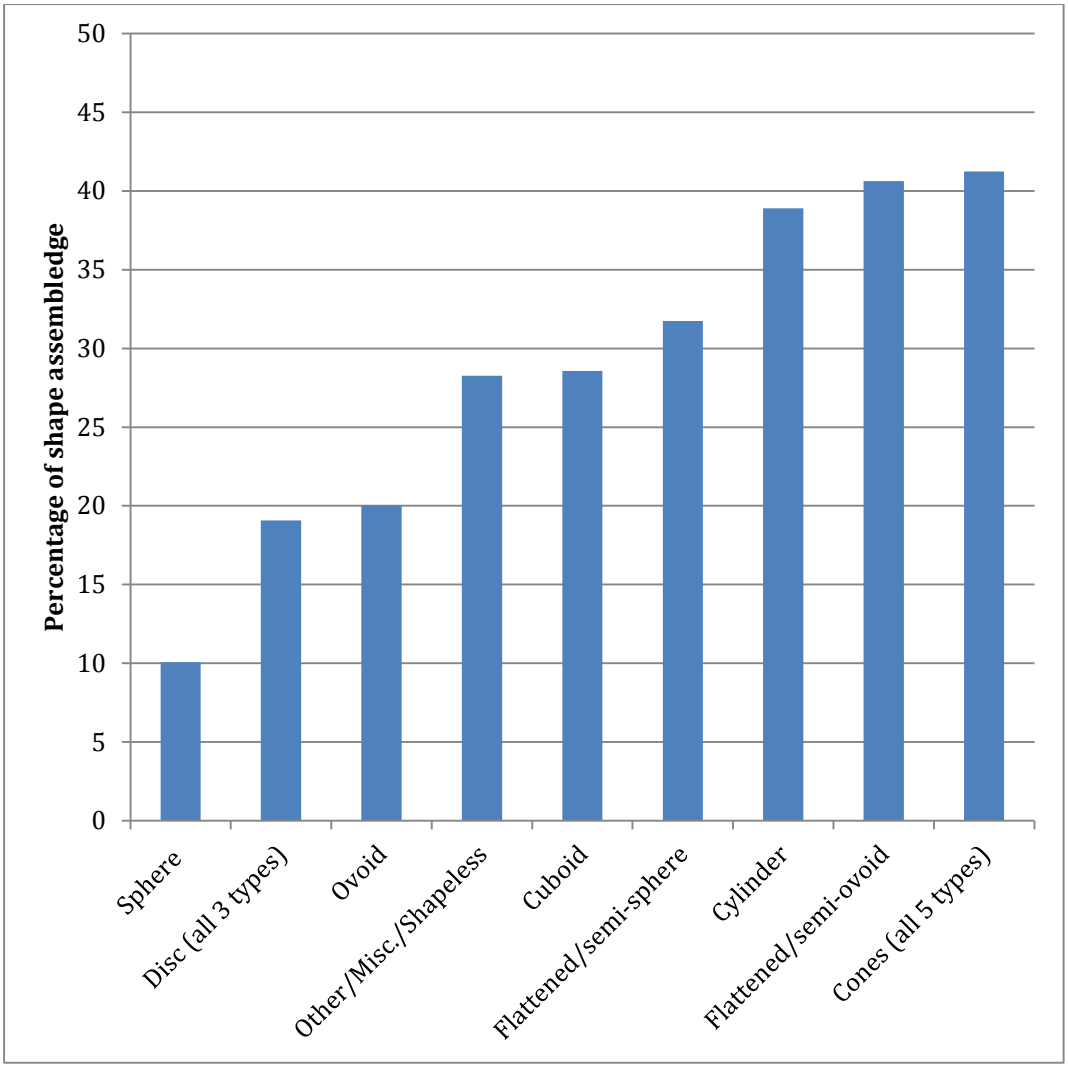
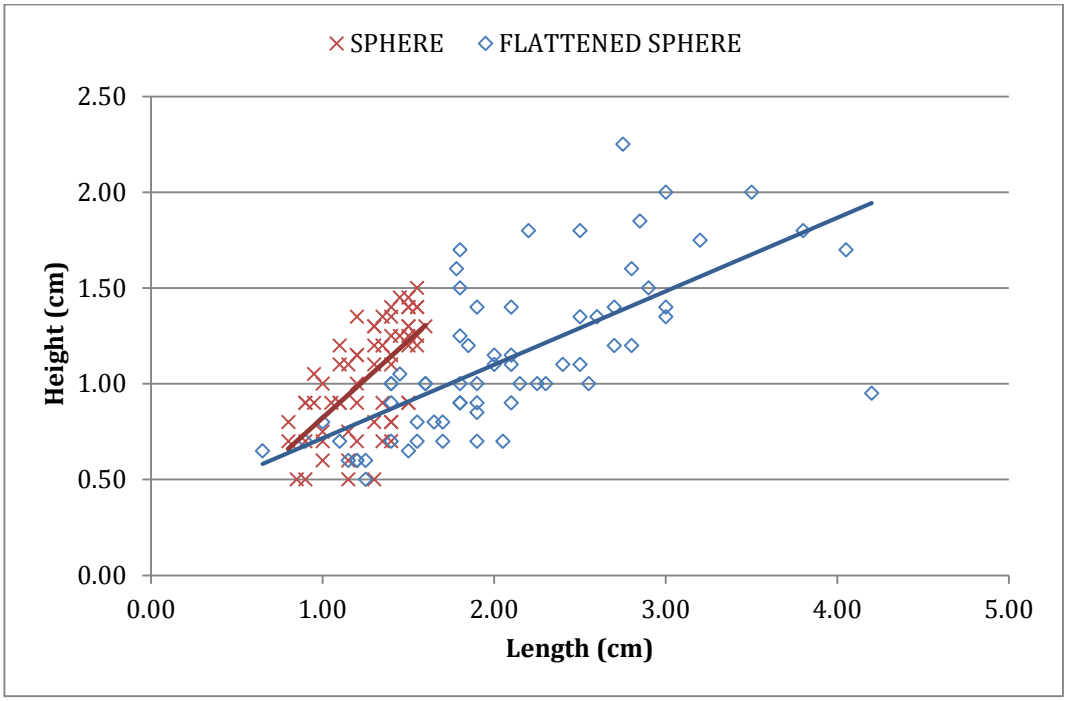


Figure A.C-8: Presence of wear by three-dimensional shape as a proportion of each shape's assemblage.



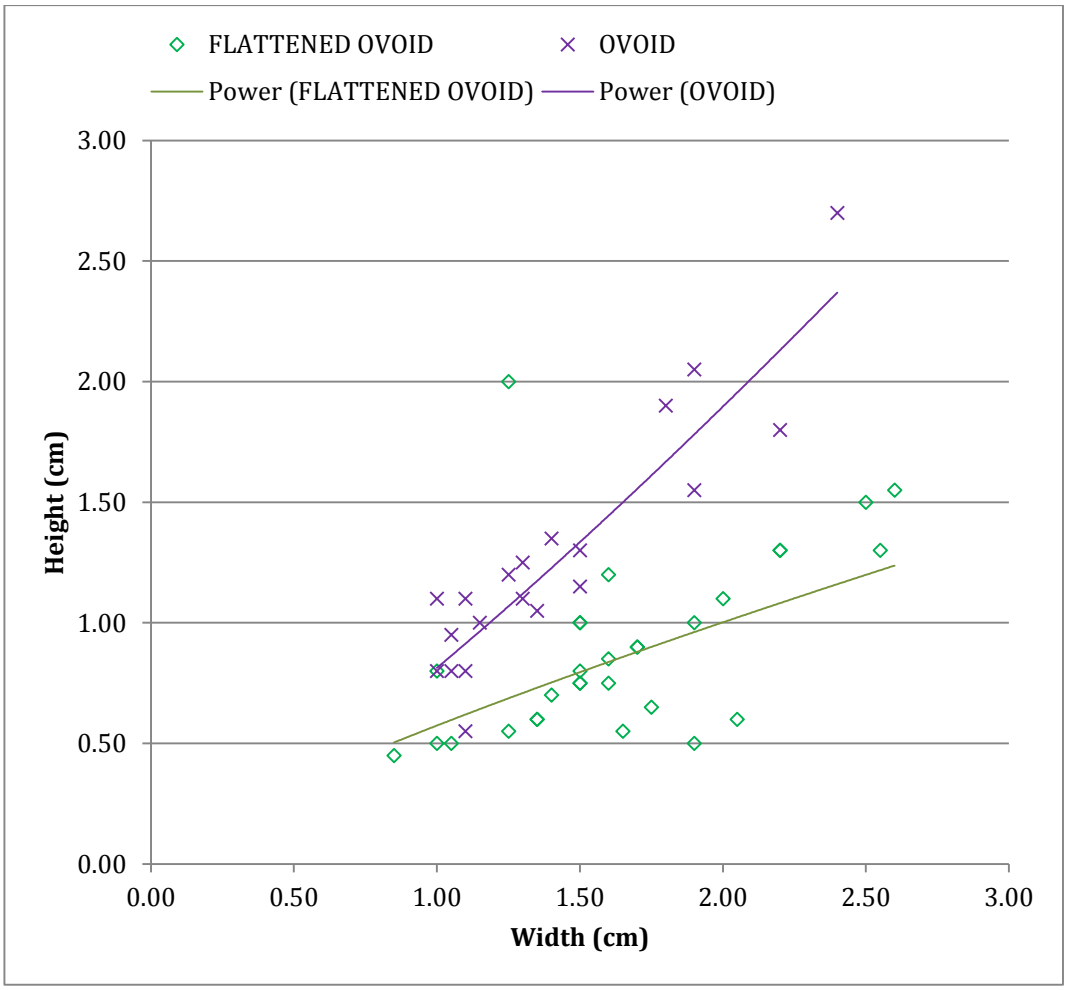


Figure A.C-9: Shape standardisation at Çatalhöyük: comparative chart displaying: **(top)** the length and height (in centimetres) of spheres and flattened/semi-spheres. **(Bottom)** ovoids and semi/flattened ovoid width and height (in centimetres).

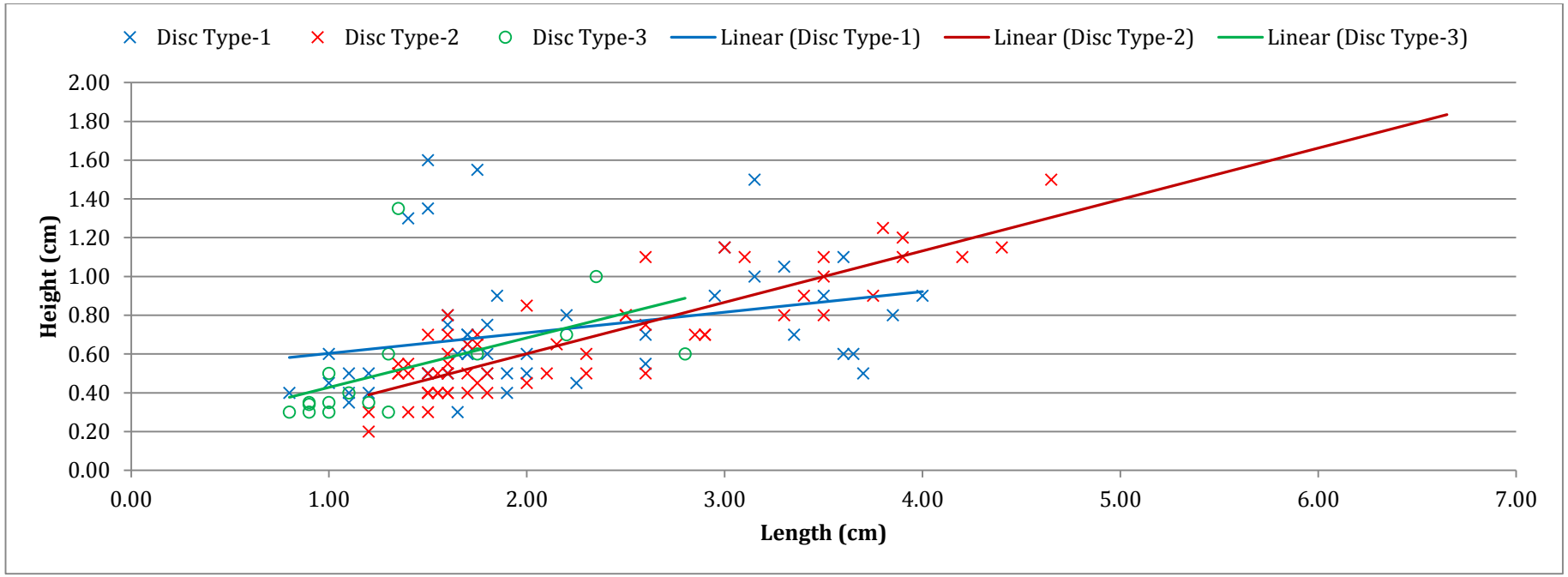


Figure A.C-10: Disc base diameter ("length") against height by sub-type in centimetres.

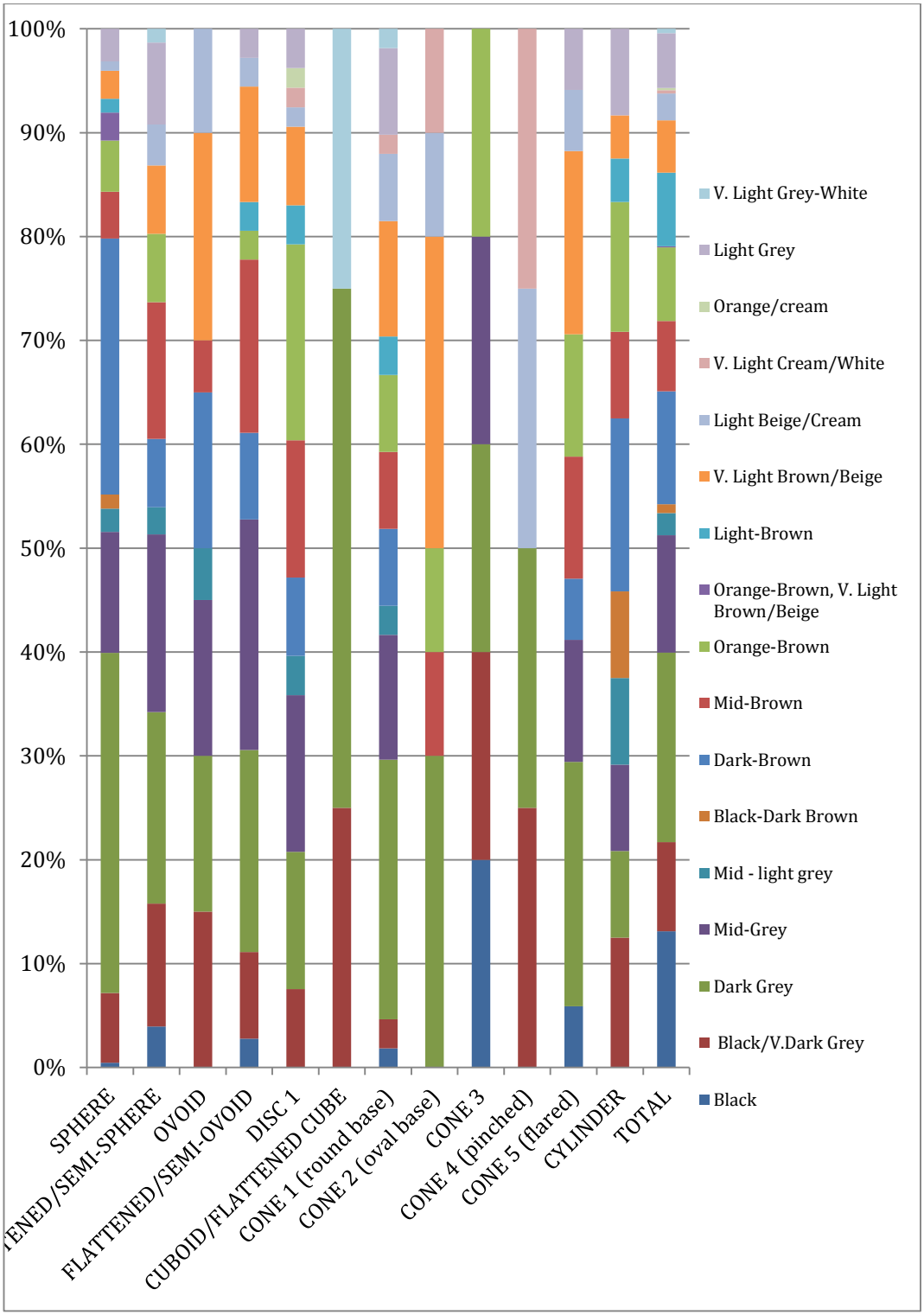


Figure A.C-11: Range and proportion of objects of each main/base colour within each three-dimensional shape category, and compared to the total assemblage.

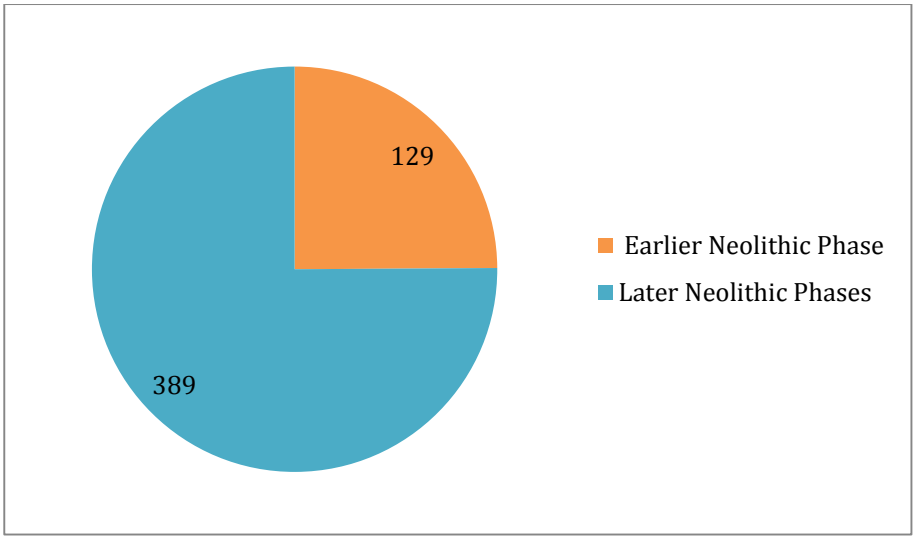


Figure A.C-12: Total number of objects from units within the *earlier* Neolithic occupation phases compared to the *later* phases (from a total of 518 objects-data available from most units within areas South, 4040/North and TP only). See Appendix D, figure A.D-1 for similar figures according to type of object: all n=1,214 "mini" ball registered objects recovered from Çatalhöyük up to 2011, all definitive quadruped zoomorphic clay figurines (as identified by 2011) and small stone geometrics.

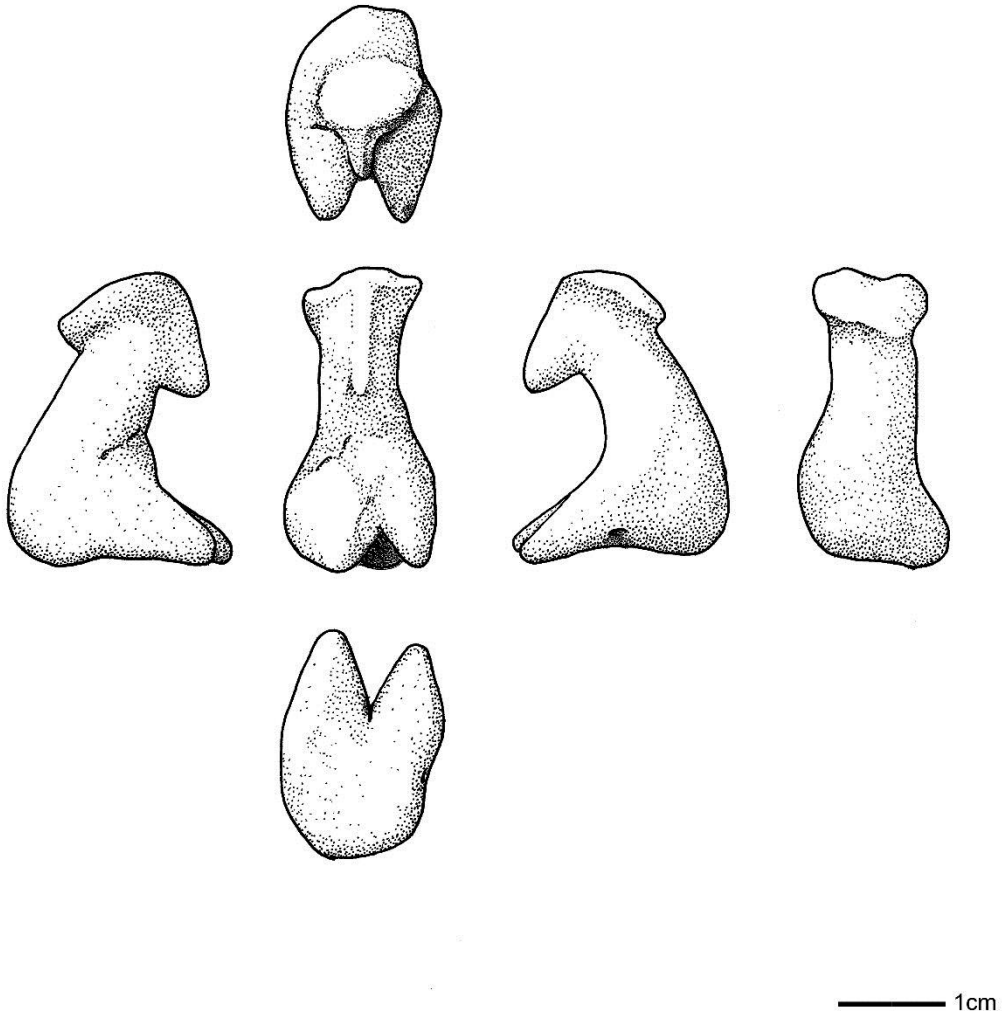


Figure A.C-13: Figurine 19303.X6. This object is clearly an anthropomorphic figurine with two moulded legs in addition to other human-like features. (Drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

Figure A.C-14: Figurine 4850.H1. This object is cone shaped, and aside from having two individually moulded schematically rendered legs, there are no other human-like features, making the object appear on first glance like a cone and half way between the cone type and the figurine type in Figure A.C-18 above. (Photographs: author's own).

Figure A.C-15: Figurine 5478.H1 viewed in plan and side view. The object is cone shaped aside from having a pinched tip which suggests anthropomorphic features. Many cones have a fragmented tip and therefore the potentially only telling anthropomorphic features may be lost, making it difficult to discern if the object was a plain cone or an anthropomorphic figurine. (Photographs: Lynn Meskell, courtesy of the Çatalhöyük Project).

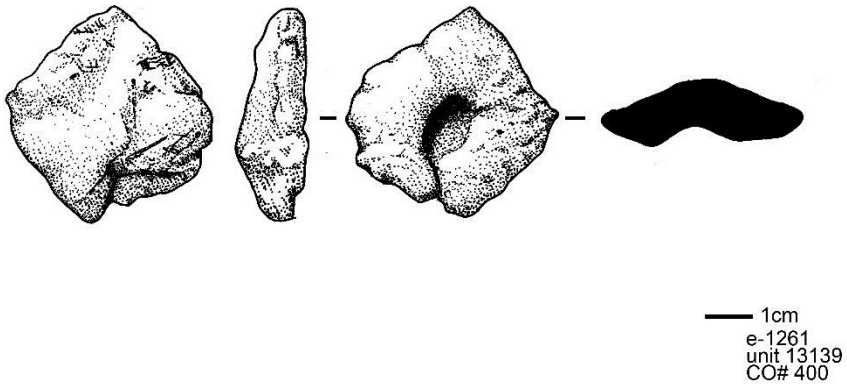


Figure A.C-16: *Possible* sealing CO# 40. See figure 7.12 for photograph. (Drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

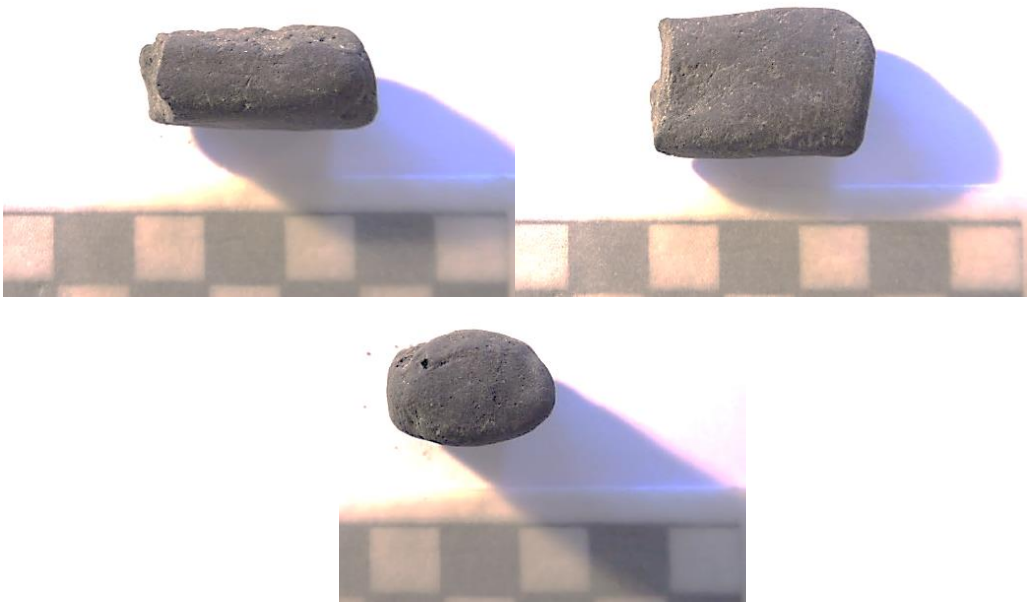


Figure A.C-17: Cuboid-shaped geometric, CO# 1241; side, base, section. (Photographs: Author's own, courtesy of the Çatalhöyük Project).

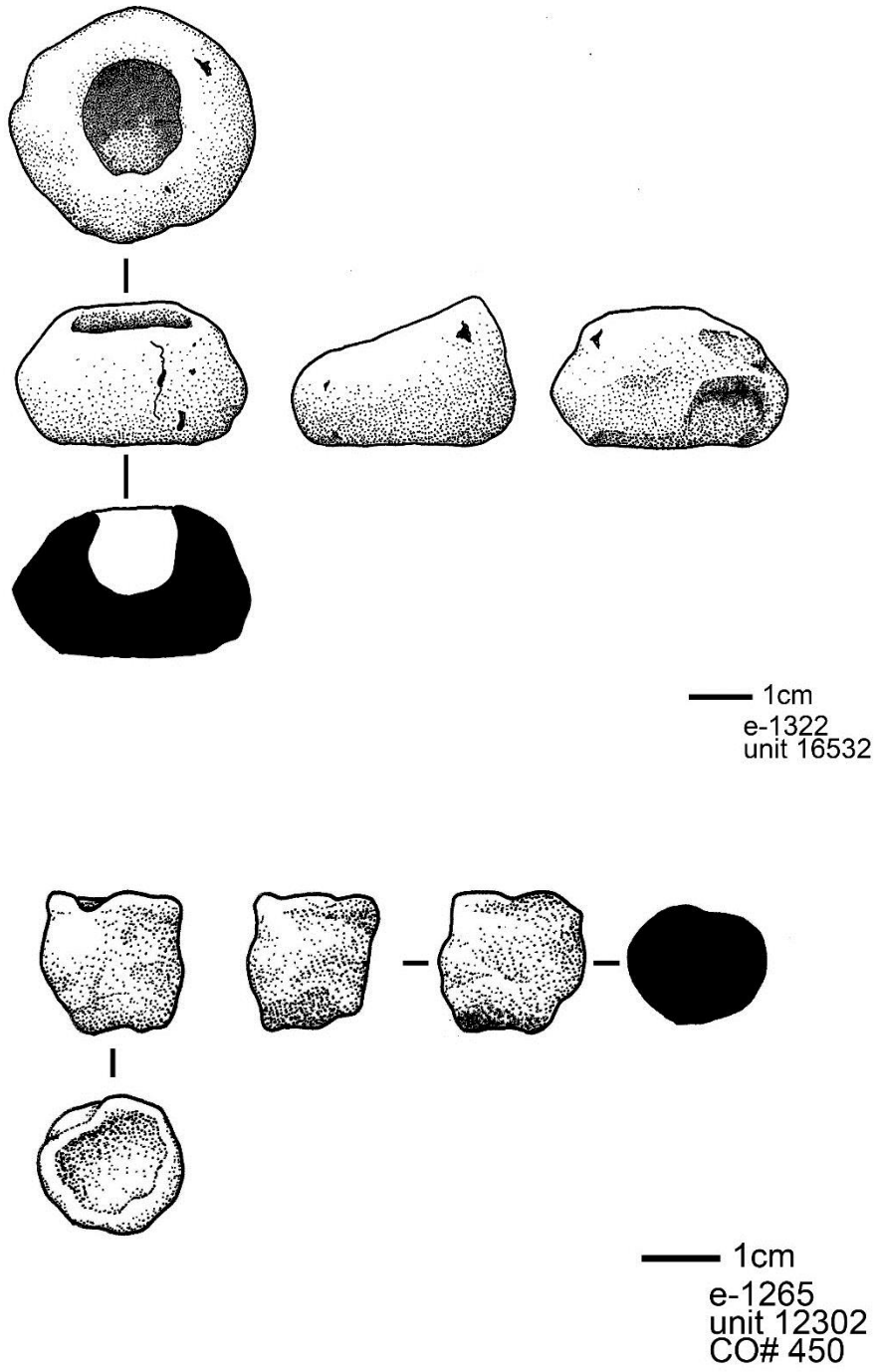


Figure A.C-18: Two miniature vessel-like objects from Çatalhöyük. CO#s 1072 **(top)** and 450 **(bottom)**. (Drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

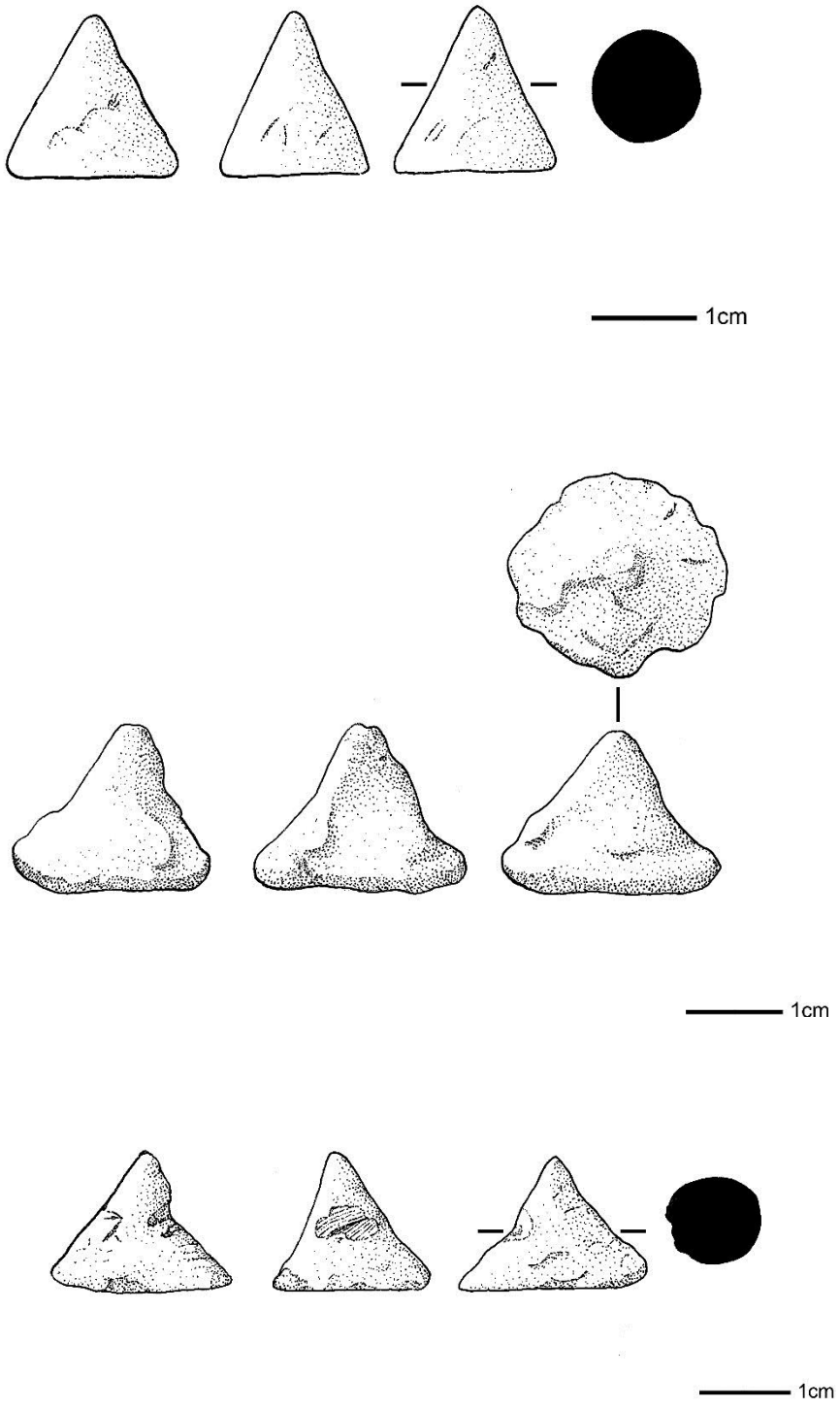


Figure A.C-19: Selection of cones from Çatalhöyük. **Top to bottom:** CO#s 1117, 1084 and 1120. (Drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

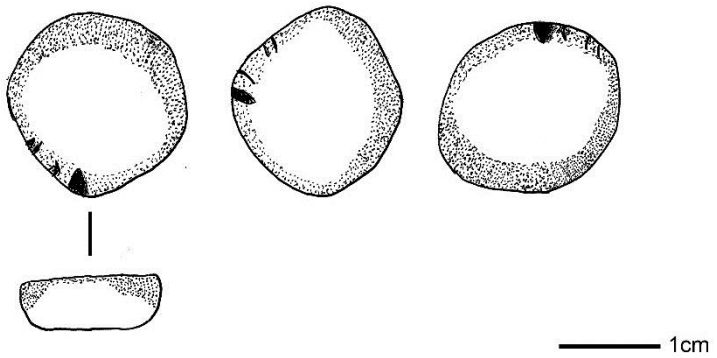


Figure A.C-20: Disc-shaped geometric. CO# 1136. (Drawing: Mesa Schumacher, courtesy of the Çatalhöyük Project).

TABLES

BASIC COLOUR SHADES (pure colour only, or description containing this colour)	**NUMBER OF ÇATALHÖYÜK OBJECTS**	**PERCENTAGE OF ÇATALHÖYÜK OBJECTS (**containing this colour in their description)
Dark Grey	250	36.98
Black	122	18.05
Mid-Grey	105	15.53
Dark Brown	101	14.94
Beige	71	10.50
Orange	67	9.91
Light Grey OR V. Light Grey	49	7.25
Light Brown OR V. Light Brown	47	6.95
Cream	29	4.29
White	7	1.04

Table A.C-.1: Basic colours and shades represented by the Çatalhöyük objects.

[Appendix C]

COLOUR	NUMBER OF ÇATALHÖYÜK OBJECTS	PERCENTAGE OF ÇATALHÖYÜK OBJECTS
Black	122	18.05
Black/V.Dark Grey	80	11.83
Dark Grey	170	25.15
Mid-Grey	105	15.53
Mid -light grey	20	2.96
Black-Dark Brown	8	1.18
Dark-Brown	101	14.94
Mid-Brown	63	9.32
Orange-Brown	66	9.76
Orange-Brown, V. Light Brown/Beige	1	0.15
Light-Brown	66	9.76
V. Light Brown/Beige	47	6.95
Light Beige/Cream	24	3.55
V. Light Cream/White	3	0.44
Orange/cream	2	0.30
Light Grey	49	7.25
V. Light Grey-White	4	0.59

Table A.C-.2: Exact colour combination of all objects recorded from Çatalhöyük.

MINERAL ONLY-INCLUSION TYPE	NUMBER OF OBJECTS	PERCENTAGE OF ALL ÇATALHÖYÜK OBJECTS
Quartz	1	0.15
Mica (only)	178	26.33
Chert-radiolarite (only)	3	0.44
Calcite (limestone) (only)	30	4.44
Total # objects with 1 type of mineral inclusion only (and no organic)	**212**	**31.36**
1) Mica 2) Unidentified	3	0.44
1) Calcite (limestone) 2) Unidentified	1	0.15
1) Mica 2) Radiolarite	1	0.15
1) Mica 2) Quartz/feldspar	3	0.44
1) Mica 2) Chert-Radiolarite 3) Calcite (limestone)	3	0.44
1) Mica 2) Quartz	0	0.00
1) Mica 2) Calcite (limestone)	46	6.80
1) Chert-Radiolarite 2) Mica 3) Quartz (?)	1	0.15
1) Cert-Radiolarite 2) Mica	1	0.15
1) Calcite (limestone) (limestone) 2) Chert-Radiolarite	2	0.30
Unidentified	3	0.44
Total # objects with 1 type of mineral inclusion only (and no organic)	**212**	**31.36**
Unidentified	**3**	0.44

Table A.C-.3: Detail of the objects with mineral only inclusions detailing the range and combination of inclusion types represented.

CLAY OBJECT #	SMALL FIND #	THREE-DIMENSIONAL SHAPE	DEGREE OF COMPLETENESS (%)	SHAPE, SECTION-VIEW	SHAPE DETAIL: DEPRESSIONS?	SHAPE DETAIL: DEPRESSIONS DETAIL	CRAFT	CLAY TEXTURE	ORIGINAL SURFACE FINISH	COLOUR	PLAN VIEW CIR.	LENGTH (CM)	WIDTH (CM)	HEIGHT (CM)	WEIGHT (GRAMS)
1,080	CH2008-16766-4040-CO13	CONE 1 (round base)	100	BASE: Flat, TOP: Curved point (i.e. Type 11)	None	n/a	Moulded/Sculpted, Rolled	Fine	Very Smooth	Mid-Brown	6.3	2.00	1.80	1.10	2.30
1,233	12524.X4	CONE 1 (round base)	100	BASE: Flat, TOP: Point	Base	Finger depression on the base making it concave.	Moulded/Sculpted, Rolled	Fine	Very Smooth	Dark Grey, Mid-Brown, Orange-Brown	4.4	1.40	1.30	3.50	2.60
1,267	16497.X1	CONE 1 (round base)	75 to 99	BASE: Flat, TOP: Point	Base	The base has a convex curve.	Moulded/Sculpted, Rolled	Fine	Very Smooth	Dark-Brown	5.7	1.70	1.60	3.00	5.50
1,273	16469.H2	CONE 1 (round base)	50 to 74	BASE: Flat, TOP: Point	Base	Small, finger-tip; sized depression on the base.	Moulded/Sculpted, Rolled	Fine	Very Smooth	Dark-Brown	6.6	2.10	1.80	2.10	7.20
1,275	16488.X7	CONE 1 (round base)	75 to 99	BASE: Flat, TOP: Point	Base	Clear and deep depression in the centre of the base.	Moulded/Sculpted, Rolled	Fine	Very Smooth	Dark Grey	4.6	1.40	1.25	2.15	2.70
1,279	18152.X8	CONE 1 (round	75 to 99	BASE: Flat,	Base	Regular, fingertip	Moulded/Sculpted, Rolled	Fine	Very Smooth	Light Grey	4.00	1.20	1.10	2.20	1.80

		base)		TOP: Point		depression in the base 0.2cm deep.									
1,281	18152.X3	CONE 1 (round base)	75 to 99	BASE: Flat, TOP: Point	Base	Fingertip depression on the base.	Moulded/Sculpted, Rolled	Fine	Very Smooth	Light-Brown, Mid - light grey	5.3	1.50	1.40	3.80	4.30
1,319	8882.H1	CONE 1 (round base)	75 to 99	BASE: Flat, TOP: Point	Base	Depression in centre of the base.	Moulded/Sculpted, Rolled	Fine	Very Smooth	Mid-Grey	4.5	1.30	1.25	1.70	2.10
1,339	4865.H1	CONE 1 (round base)	75 to 99	BASE: Flat, TOP: Point	Base	The base has a shallow depression.	Moulded/Sculpted, Rolled	Fine	Very Smooth	Light Beige/Cream		1.20	1.00	1.40	1.00
1,342	6261.H1	CONE 1 (round base)	75 to 99	BASE: Flat, TOP: Point	Base	Finger-tip size and shape depression in the base.	Moulded/Sculpted, Rolled	Fine	Very Smooth	Mid-Grey, V. Light Brown/ Beige	4.4	1.30	1.30	1.50	1.70
1,344	4709.H3	CONE 1 (round base)	100	BASE: Flat, TOP: Point	None	n/a	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Very Smooth	V. Light Brown/ Beige	5.5	1.70	1.65	1.40	2.70

Table A.C-4: Distinctive cones set "A": type 1 with a round and concave base.

CLAY OBJECT #	SMALL FIND #	THREE-DIMENSIONAL SHAPE	DEGREE OF COMPLETENESS (%)	SHAPE, SECTION-VIEW	DEPRESSIONS?	CRAFT	CLAY TEXTURE	ORIGINAL SURFACE FINISH	COLOUR	PLAN VIEW CIR.	LENGTH (CM)	WIDTH (CM)	HEIGHT (CM)	WEIGHT (G)
1,084	16408.H1	CONE 5 (flared)	100	BASE: Flat, TOP: Curved point (i.e. Type 11)	None	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Smooth	Orange-Brown	6.60	2.05	1.90	1.40	3.20
1,117	4878.H2	CONE 1 (round base)	100	BASE: Flat, TOP: Point	None	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Very Smooth	V. Light Brown/Beige	5.20	1.50	1.50	1.40	1.70
1,118	4878.H3	CONE 1 (round base)	100	BASE: Flat, TOP: Point	None	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Very Smooth	Light Grey	4.60	1.40	1.30	1.30	1.60
1,119	4878.H1	CONE 5 (flared)	100	BASE: Flat, TOP: Point	None	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Very Smooth	V. Light Brown/Beige	5.50	1.50	1.45	1.40	1.80
1,120	4882.H1	CONE 5 (flared)	100	BASE: Flat, TOP: Point	None	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Very Smooth	Light Grey	6.20	2.00	1.80	1.35	2.10
1,151	CH1999-5290-South-CO1	CONE 1 (round base)	100	BASE: Flat, TOP: Point	None	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Very Smooth	Mid-Grey	3.70	1.15	1.10	1.00	0.60

Table A.C-5: Distinctive cone set "B". See Chapter 7, section 7.2 (Extended Object Form and Notable Collections: "Cones") for category description.

CLAY OBJECT #	SMALL FIND #	THREE-DIMENSIONAL SHAPE	DEGREE OF COMPLETENESS (%)	SHAPE, SECTION-VIEW	DEPRESSIONS?	DETAIL	CRAFT	CLAY TEXTURE	ORIGINAL SURFACE FINISH	COLOUR	PLAN VIEWCIR.	LENGTH (CM)	WIDTH (CM)	HEIGHT (CM)	WEIGHT (G)
457	CH2005-13106-4040-CO5	CONE 1 (round base)	100	BASE: Flat, TOP: Point	None	n/a	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Smooth	Black/V.Dark Grey	3.20	1.05	0.80	1.80	1.10
472	13103.H8	CONE 1 (round base)	100	BASE: Flat, TOP: Point	1 side, Top	Front and one side (in longitude) have shallow, diagonal depressions where ether object has been crafted with three strokes from the top right to the bottom left.	Moulded/Sculpted, Rolled	Fine	Smooth	Dark Grey	3.10	1.05	0.85	2.70	2.30
487	CH2003-7575-4040-CO5	CONE 4 (pinched)	75 to 99	BASE: Flat, TOP: Curved point (i.e. Type 11)	Base	Base appears flat yet is actually a shallow depression.	Moulded/Sculpted, Rolled	Fine	Smooth	Light Beige/Cream	5.50	1.35	1.30	1.70	2.20
498	CH2006-14106-4040-CO5	CONE 1 (round base)	75 to 99	BASE: Flat, TOP: Curved point (i.e. Type 11), TOP: Flat	Base	Shallow, circular depression in the base.	Defined Base Moulded/ Flat, Moulded/Sculpted, Rolled	Fine	Smooth	Mid-Brown	3.70	1.10	1.10	0.85	0.90

Table A.C-6: Distinctive cones set “C”. See Chapter 7, section 7.2 (Extended Object Form and Notable Collections: “Cones”) for category description.

AREA & MELLAART APPROXIMATE EQUIV. PHASE	HODDER PHASE	NUMBER OF OBJECTS RECORDED	AS A % OF EACH AREA'S RECORDED OBJECTS	BROAD NEOLITHIC PHASE
4040/North	4040.?F	1	0.35	***Earlier*** **Neolithic**
Mellaart VI-XII	4040.F	1	0.35	
Mellaart VI-XII	4040.G	21	7.42	
Mellaart VI-XII	4040.?G	36	12.72	
Mellaart VI	Scrape, ?G	9	3.18	
Mellaart post VI	4040.H	10	3.53	***Later*** **Neolithic**
Mellaart post VI	4040.?H	2	0.71	
Mellaart post VI	4040.I	177	62.54	
Mellaart post VI	4040.J	0	0.00	
-	*Post-Chalcolithic*	*8*	*2.83*	
-	*Unknown*	*13*	*4.59*	
-	*Unstratified Neolithic*	*5*	*1.77*	
-	**4040 TOTAL**	**283**	-	
South	South.G	15	6.17	***Earlier*** **Neolithic**
Mellaart IX-XII	South.G South.I South.H	2	0.82	
Mellaart IX-XII	South.I	0	0.00	
Mellaart IX-XII	South.J	1	0.41	
Mellaart IX-XII	South.K	2	0.82	
Mellaart IX	South.?L South.?K	1	0.41	
Mellaart VIII/IX	South.?K	0	0.00	
Mellaart IX	South.L	1	0.41	
Mellaart IX	South.?L	6	2.47	
Mellaart VIII/IX	South?M	7	2.88	
Mellaart VIb	South.?N	0	0.00	
	South.N	1	0.41	
Mellaart VIa	South.?O	0	0.00	
Mellaart VIa	South.O	25	10.29	
-	South.O South.P South.O	1	0.41	
_	South.P	93	38.27	***Later*** **Neolithic**
_	South.Q	33	13.58	
_	South.Q & South.R	0	0.00	
_	South.R	12	4.94	
Mellaart V	South.S	8	3.29	
Mellaart IV	South.T	1	0.41	
Mellaart IV?	South.?T	0	0.00	
-	*South.Unknown*	*17*	*7.00*	
-	*South.Unstratified.Neolithic*	*9*	*3.70*	
-	**South TOTAL**	**235**		
Bach	Bach.G.	13	92.86	
-	Bach.Unassigned	1	7.14	
-	**BACH TOTAL**	**14**	-	
TP	TP.M	2	3.77	***Later*** **Neolithic**
Mellaart post VI	TP.N	26	49.06	
Mellaart post VI	TP.O	6	11.32	
Mellaart post VI	TP.P	7	13.21	
Mellaart post VI	TP.Q	2	3.77	
Mellaart post VI	TP.R	7	13.21	
-	TP.S	1	1.89	
-	TP.T	1	1.89	
-	TP.W	1	1.89	
-	*TP.Post Neolithic*	*0*	*0.00*	
-	*TP.Unassigned*	*0*	*0.00*	
-	**TP TOTAL**	**53**	-	

Table A.C-7: Table listing the number of objects recorded by site area, Hodder phase and approximate equivalent relative Mellaart level.

HODDER PHASE	TOTAL NO. OF SMALL CLAY GEOMETRICS RECORDED	NUMBER OF GEOMETRICS (from a unit within this phase with a vol. calculation)	TOTAL VOL (IN LITRES) Of unit in this Phase (containing recorded small geometrics)	DENSITY
4040.?F	*1*	*0*	*n/a*	*n/a*
4040.F	1	1	1015.00	0.000985
4040.G	21	18	17692.62	0.001017
4040.?G	36	28	17436.50	0.001606
Scrape, ?G	9	9	1984.81	0.004534
***Earlier* Neolithic Phases Total**	**68**	**56**	**38128.93**	**0.001469**
4040.H	10	8	8321.00	0.000961
4040.?H	2	2	1163.50	0.001719
4040.I	177	177	54511.87	0.003247
4040.J	*0*	*0*	*n/a*	*n/a*
***Later* Neolithic Phases Total**	**189**	**187**	**63996.37**	**0.002922**

Table A.C-8: Density of objects (per litre of excavated deposit) in each Hodder phase of settlement, within the North/4040 excavation area. *Earlier* Neolithic phases are in blue, *later* Neolithic phases are in red.

HODDER PHASE	TOTAL NO. OF SMALL CLAY GEOMETRICS RECORDED	NUMBER OF GEOMETRICS (from a unit within this phase with a vol. calculation)	TOTAL VOL (IN LITRES) Of unit in this Phase (containing recorded small geometrics)	DENSITY
South.G	15	15	13984.75	0.001073
South.G South.I South.H	*2*	*0*	*0.00*	*n/a*
South.I	*0*	*0*	*0.00*	*n/a*
South.J	*1*	*0*	*0.00*	*n/a*
South.K	2	2	8757.50	0.000228
South.?L South.?K	1	*0*	*0.00*	*n/a*
South.?K	0	*0*	*0.00*	*n/a*
South.L	1	1	90.75	0.011019
South.?L	6	5	1836.70	0.002722
South.?M	7	3	2100.00	0.001429
South.?N	0	1	6930.50	0.000144
South.N	*1*	*0*	*0.00*	*n/a*
South.?O	0	15	9498.05	0.001579
South.O	25	4	6372.00	0.000628
Earlier **Neolithic Phases Total**	**61**	**46**	**49570.25**	**0.000928**
South.O South.P South.O	1	1	370.50	0.002699055
South.P	93	82	50826.61	0.001613
South.Q	33	29	6511.45	0.004454
South.Q+South.R	*0*	*0*	*0.00*	*n/a*
South.R	12	9	6437.61	0.001398
South.S	8	8	5916.50	0.001352
South.T	1	1	360.80	0.002772
South.?T	*0*	*0*	*0.00*	*n/a*
Later **Neolithic Phases Total**	**147**	**129**	**70052.97**	**0.001841**

Table A.C-9: Density of objects (per litre of excavated deposit) in each Hodder phase of settlement, within the South excavation area. *Earlier* Neolithic phases are in blue, *later* Neolithic phases are in red.

APPENDIX D: ÇATALHÖYÜK ADDITIONAL OBJECTS

INTRODUCTION

This appendix presents analysis of small objects from Çatalhöyük, studied in addition to the small, geometric clay objects recorded from the site. Three object categories are covered:

1-"Mini [clay] balls"
2-Small stone spheres
3-Zoomorphic clay figurines

"Mini balls" are a common find and artefact category at Çatalhöyük (Chapter 7 figure 7.18). Though merely small, clay spheres, those objects commonly specifically selected and classified as "mini balls" at Çatalhöyük (e.g. Atalay 2013: 247, 248-52; Atalay 2005, Atalay 2001) share a number of distinctive morphological characteristics (see Chapter 7: discussion and figure 7.8b, figure 7.17 and figure 7.19). All objects at Çatalhöyük were studied with a disregard to the site's functional classifications; therefore 72 "mini ball" designated spheres were recorded from a much larger total number. Due to the exceptional similarity of form, and the abundance of "mini balls" at Çatalhöyük, all other "mini balls" were recorded at tier 2 level and spatial analysis carried out on all 1,254 examples.

In contrast, small stone spheres are very rare at Çatalhöyük. Though the existence of a small number of stone spheres was known, the majority of the actual objects themselves could not be retrieved, and therefore again, the stone spheres were recorded largely at tier 2 level. Lastly, the small clay zoomorphic figurines from the site were considered in addition to the site's geometric objects. If geometrics acted as tokens, with perhaps even certain shapes representing particular commodities, or specific counts of other units (people, livestock, households, children etc.) then zoomorphic figurines may have played a part in this system.

1- "MINI BALLS"

Category Overview

The n=72 the distinctive "mini balls" studied in detail and recorded on the *Clay Object Database* (Appendix A) constitute only a small, yet representative sample of the total of n=1,254 such objects recorded as "mini [clay] balls" at Çatalhöyük (see Chapter 7 for

discussion of the general and defining morphological characteristics of this group). As all are very similar, spatial analysis was carried out on all objects classified by the Çatalhöyük finds team (up to 2012) as "mini [clay] balls" in order to consider the context of the category in a wider sense. The "mini balls" were studied from site records (at tier 2 level) and their spatial distribution is analysed below, along with the additional 72 tier 1 recorded "mini balls". Unlike other geometrics at Çatalhöyük, a large proportion of the "mini balls" are found in: a) caches with large numbers of identical objects and b) intentionally placed inside buildings, mostly within the main room. Like with the other studied geometrics from Çatalhöyük, "mini balls" are found mainly in the South and North areas reflecting those areas of site most excavated. 46.7% of all "mini balls" recovered from Çatalhöyük come from the North Area, and a similar proportion, 45% come from the South. Bach, IST and TP areas are also represented, through with far smaller quantities.

Spatial Distribution

"Mini balls" are far more frequent in Çatalhöyük's *later* occupation phases (Mellaart Levels V-I), in both the South and North Areas. In the South Area, only 4 objects (0.7% of all South Area "mini balls") come from the *earlier* occupation phases (Mellaart level VI to XII) compared to the 99.1% (n=554) which come from the *later* Neolithic phases (figure A.D-1a). Almost of the South Area's later phase "mini balls" come from three specific levels of settlement, Hodder phases South.?N., South.?O. and South.O. (equivalent to Mellaart Levels VIa and VIb), chronologically marking the middle the settlement of Çatalhöyük East (figure A.D-2). The North (4040) Area shows similar temporal distributional patterning. 85.9% of the area's "mini balls" come from the *later* Neolithic phases, most from Hodder phase 4040.?G., which is again equivalent to Mellaart Level VI. Thus across the two main areas of the site, n=1,067 "mini [clay ball" designated clay objects come from the later period of settlement, almost all of which can be more specifically placed at the start of this period, roughly contemporary Mellaart level VI. This is compared to just n=66 coming from all *earlier* settlement levels. This numerical patterning is supported by density analysis (Chapter 7).

Considering the actual context type of all recovered "mini balls" from Çatalhöyük, over half (n=742, 59.74%) come from buildings, far higher than the proportion of (tier 1) recorded, small geometric clay objects (Chapter 7), and for the (tier 2) stone balls (table A.D-1). The presence of "mini balls" in buildings, found alone, or within only one or two other objects (such as Buildings 2, 12, 41, 54, 53, 52) can be dismissed as such objects

being present incidentally, as part of the general fill or floor debris. Yet some buildings contain "mini balls" in huge numbers, clearly showing they were placed there intentionally. Building 44 for example has 29 "mini balls", Building 3 has 64, Building 63 has 63, and Building 75 has 485 "mini balls" (table A.D-2 and figure A.D-3). Of those "mini balls" *not* found in a building, the type of context was nearly always midden (table A.D-3), whilst for those found *inside* buildings, "Clay Ball Cluster" (n=416) was the most common *interpretative* category (table A.D-4); they were more often found in clusters of alike objects.

The spatial distribution of all spherical shaped clay objects (those recorded on the *Clay Object Database* as "spheres" regardless of their classification by the Çatalhöyük team) was also considered, to be compared to that of the "mini balls", and confirms that the "mini balls" do indeed have different a depositional patterning compared to not only all (tier 1) small geometric objects studied from Çatalhöyük, but also from the spheres specifically. This means that it is not only their rounded shape, but other aspects of their form and craft that mark the "mini balls" out as distinct from the rest of the assemblage. Considering area and phase, the (tier 1 studied) "spheres" (recorded on the *Clay Object Database)* follow the same patterning as when considering all Çatalhöyük recorded geometrics. n=95 spheres (63.76%) come from the North Area, and of these, more than three quarters (n=75, 78.95% of North Area "spheres") come from the *later* set of Neolithic phases (peaking in a single phase: *4040.I*), like the "mini balls" and all tier 1 studied Çatalhöyük clay objects. Considering the immediate context, "spheres" also mirror the patterning seen for all Çatalhöyük geometrics combined in contrast to that of the "mini balls" specifically, with just over half (n=85, 57%) of spheres coming from middens, and the remainder coming from fill contexts (n=26, 17.5%).

2-STONE OBJECTS

In addition to the clay objects, a much smaller number of spherical shaped stone "balls" have been recovered from Çatalhöyük (figure A.D-4). 23 are recorded at the site in total, although only 19 of these are small enough to be considered here as small geometrics: CO#s 2688-2706. The small stone spheres constitute 2.81 % of the studied small geometrics from the site (676 clay objects studied fully at tier 1 level. A total of 695 objects including the 19 stone spheres). As most of these were recorded in lesser detail than their clay counterparts (via site records only), they are analysed separately below.

The small stone spheres come from a range of excavation seasons (1993-2008). At Çatalhöyük, "stone balls" are defined as "spherical... deliberately shaped" (they do not include naturally occurring pebbles). No other small geometric shapes in stone have been recovered. Due to the range of excavation seasons and contexts the objects come from, plus the fact they have hitherto been studied as a collection, it was not possible to retrieve them from storage for study, only a small sample (3-4) were studied in person, with information related to the majority gleaned from the *Groundstone Database*. Therefore these object form a supplementary group in addition to the large corpus (676) of small clay geometric objects.

Object Form

All small stone spheres are spherical shaped, and described as perfect spheres. 16 (84.2%) are described as "sub-spherical" (though it seems this reflects a slightly misshapen object rather than a deliberate oval shape). Therefore in shape it seems the objects are all very similar. Almost all of the stone spheres are intact and complete, 17 (89.5%) are complete, none are recorded as broken (2 are uncertain). In size, the stone spheres are all roughly similar; with the objects (where dimensions are recorded,) being restricted to 3.86 cm to 2.50 cm (in length, width and height) and all are less than 5.00 cm in their maximum dimension. This again shows a strong degree of homogeneity within the group. "Stone balls" at Çatalhöyük are classified as being intentionally shaped, and as such, a combination of "pecking" and "coarse grinding" are the techniques used in the creation of all of these objects (where recorded). Two stand out from this trend: one example (CO# 2699) with "finer abrasion" and another (CO# 2700) with "polishing" observed. The only aspect where the objects diverge is in rock type and colour. 8 (42.1%) are crafted from limestone; in white, brown or grey. Andesite, marble, schist, sandstone and quartz are also represented with one object of each rock type. Therefore the stone spheres are diverse in both rock type and colour with a total of 4 white (21%), 6 grey (316%), and 3 brown (158%) objects represented.

Spatial Distribution

An even number of stone spheres come from both the South and North (4040) excavation areas (n=8, 42.1% of objects in each). n=1 hails from TP area. Like the "mini [clay] balls" above, the majority of stone spheres are found in refuge deposits, coming from "middens" (15.8%), "fill" (31.6%), or "arbitrary" contexts (15.8%). n=5 of come from buildings (Buildings 41, 52, 54, 67 and 77), however none were recovered *in situ.* Instead they are incorporated incidentally in the fill or structural material within buildings.

Therefore the area of their original use is unclear, as is the kinds of artefacts or materials they were found with. Temporally, of those from stratified Neolithic Levels, almost twice as many stone spheres come from levels within the *earlier* Neolithic phase of settlement at Çatalhöyük, compared to the *later* phase, in sharp contrast to both the "mini balls" and the tier 1 recorded small clay objects (see figure A.D-1). Though only 9 stone spheres come from a unit allowing density analysis, calculations support this temporal patterning, with a higher *density* of stone spheres found in the *later* phases compared to the *earlier.*

3-QUADRUPED FIGURINES

Category Overview

To further investigate the idea that small geometric objects may have been used in administration, not only as counting tools, but as symbolic recording tools and possible mnemonic devices, the use of quadruped figurines as tokens for recording ownership and transactions related to animals was considered. Zoomorphic figurines are abundant at Çatalhöyük (Chapter 4.2), and like the clay geometrics, they are made from a variety of clays (figure A.D-5). Some examples are detailed and finely made, yet many comprise crude, seemingly quickly rendered representations. Thorough spatial analysis was undertaken on a total of 296 definite, and near complete (not mere fragments of horns, legs, tail etc.) quadrupeds as classified on Çatalhöyük's figurine database, and supports the view that these abundant objects were found in the same context as geometric-shaped clay objects. However as most of the shared contexts are secondary and disposal contexts, the evidence cannot be used to directly infer both classes of objects were used in the same way.

Spatial Distribution

In terms of site distribution, the context of the quadrupeds is remarkably similar to the (tier 1) small geometric clay objects with almost all coming from the two main excavation areas (South Area: 42.2% of quadrupeds, North Area 49.7% of quadrupeds). Like the studied selection of small clay geometrics, the majority of quadrupeds are from "external" areas (n=120), and only n=43 come from a "building" with an additional n=23 from an "abandoned building" (figure A.D-6). Çatalhöyük's "data category" and "interpretative category" also place the majority of quadrupeds in "midden" contexts. Few of the selected quadruped figurines come from *in situ* contexts, however six objects come from a cluster of animal figurines within unit 7957 (Building 49 in the North Area). This context could support the notion of recording, yet this is an isolated occurrence. A

further quadruped comes from an artefact "cluster" consisting of animal bones and a horn core, located in a midden in the South Area and interpreted at ritual in character.

Phase

Considering the distribution of quadrupeds by broad Neolithic phase, they are found in fairly even numbers in the *earlier* (Mellaart Levels XII-VI) and *later* (Mellaart V-I) phases of Çatalhöyük settlement, though slightly more common in the latter, post Mellaart VI phases of occupation. This is more marked in the South Area though the difference negligible (figure A.D-1b and table A.D-5). However, considering the actual phase of occupation the figurines come from, within the South Area, n=32 quadrupeds hail from a single phase, South.P. (Within Çatalhöyük's *later* Neolithic phases). This is stark as no other Hodder phase in the South Area has more than 11 quadrupeds. A similar pattern is seen in the North Area where n=58 quadrupeds come from the Hodder phase 4040.I, again within the broader *later* Neolithic stage of the site. This patterning is supported by density analysis which shows a slightly higher density of quadrupeds in the *latter* occupation phases. Thus like the "mini balls", the quadruped figurines do not demonstrate a gradual increase or decrease in their temporal presence, rather they peak in number within a certain short phase only.

FIGURES

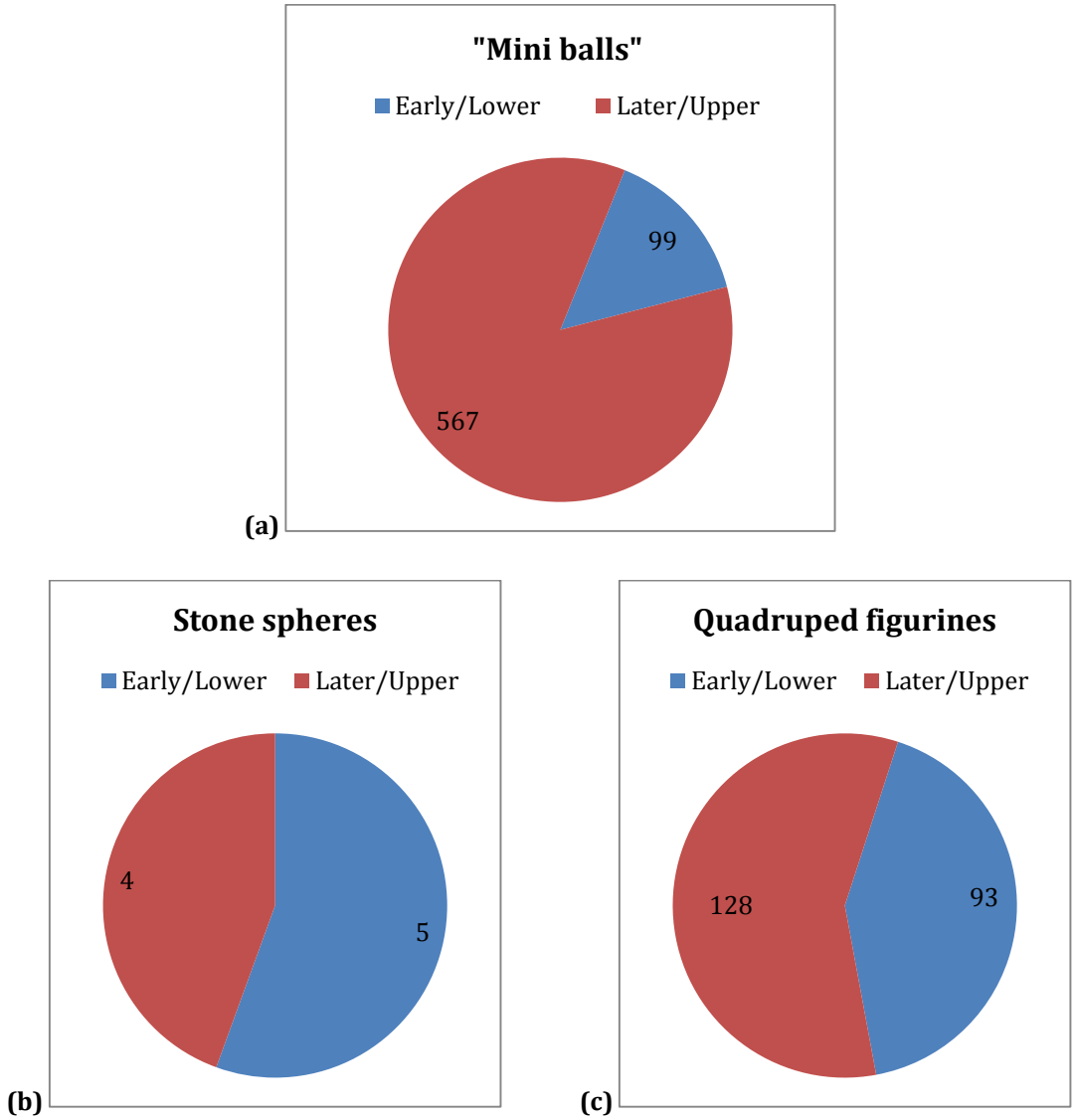
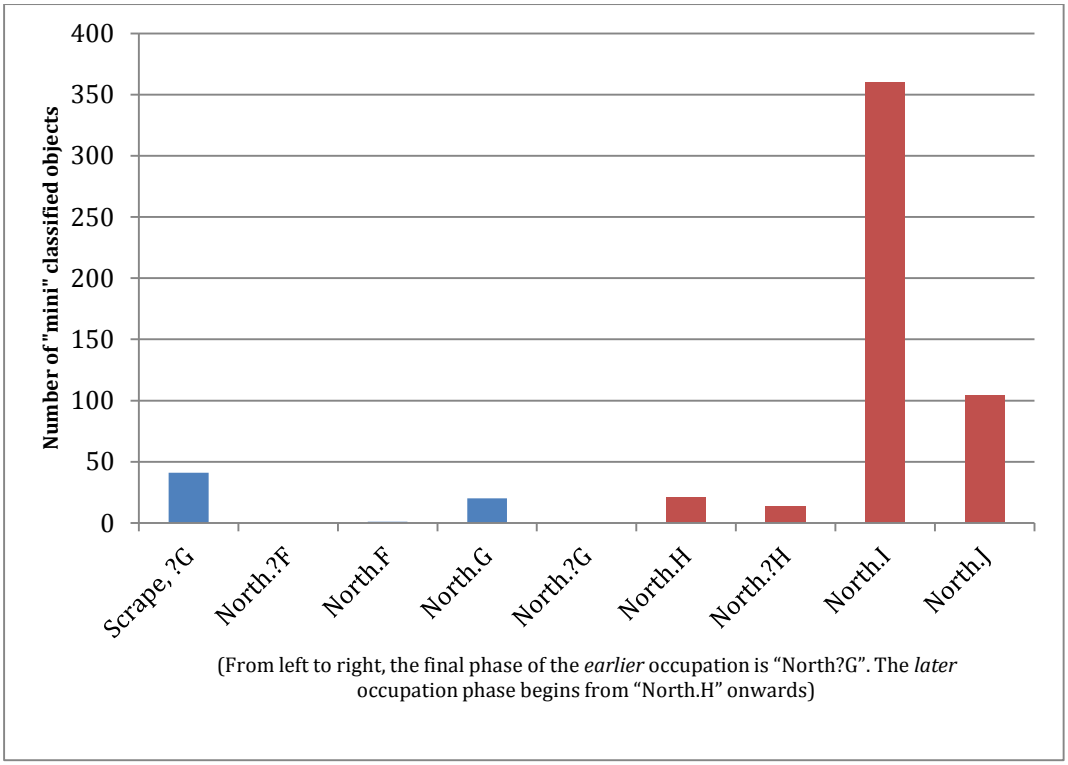


Figure A.D-1: Total number of objects from units within the earlier Neolithic occupation phases compared to the later phases. **(a)** All 1,214 "mini" ball registered objects recovered from Çatalhöyük up to 2011, **(b)** small stone geometrics (all spheres) and **(c)** definitive quadruped zoomorphic clay figurines (as identified by 2011).



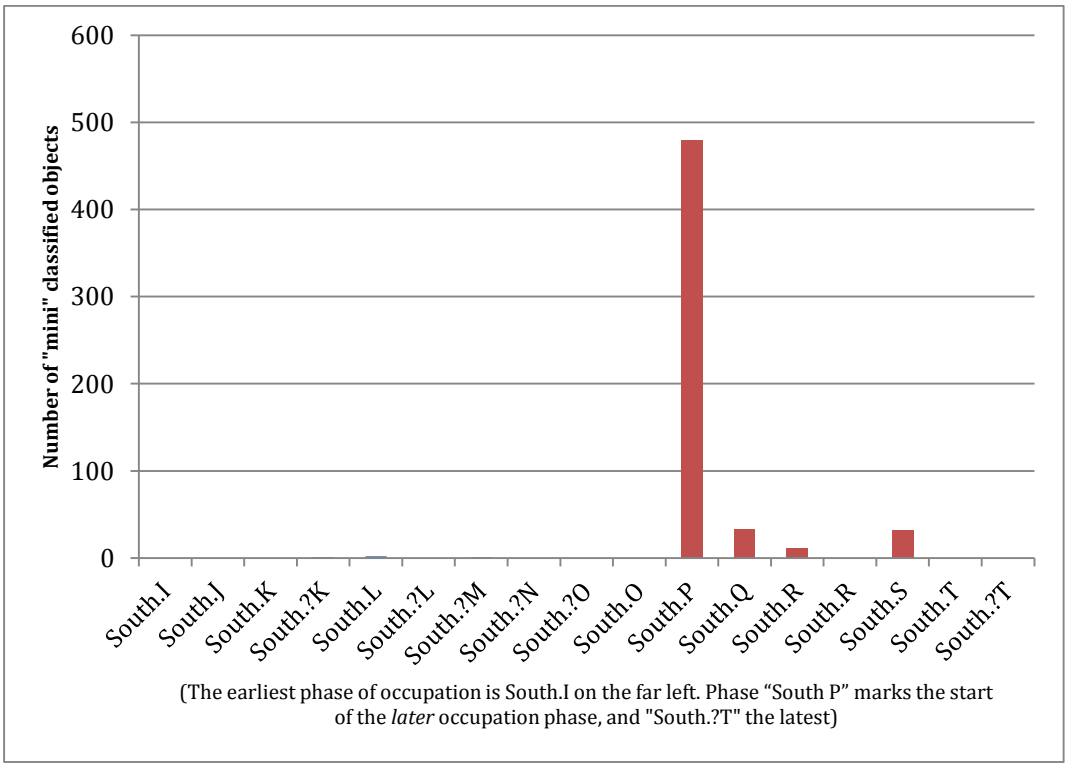


Figure A.D-2: Count of the temporal distribution of all "mini" ball registered objects (recorded at tier 1 and tier 2 level, from a total of 1,242 objects) in the North/4040 excavation Area **(top)**, and the South Area **(bottom)**.

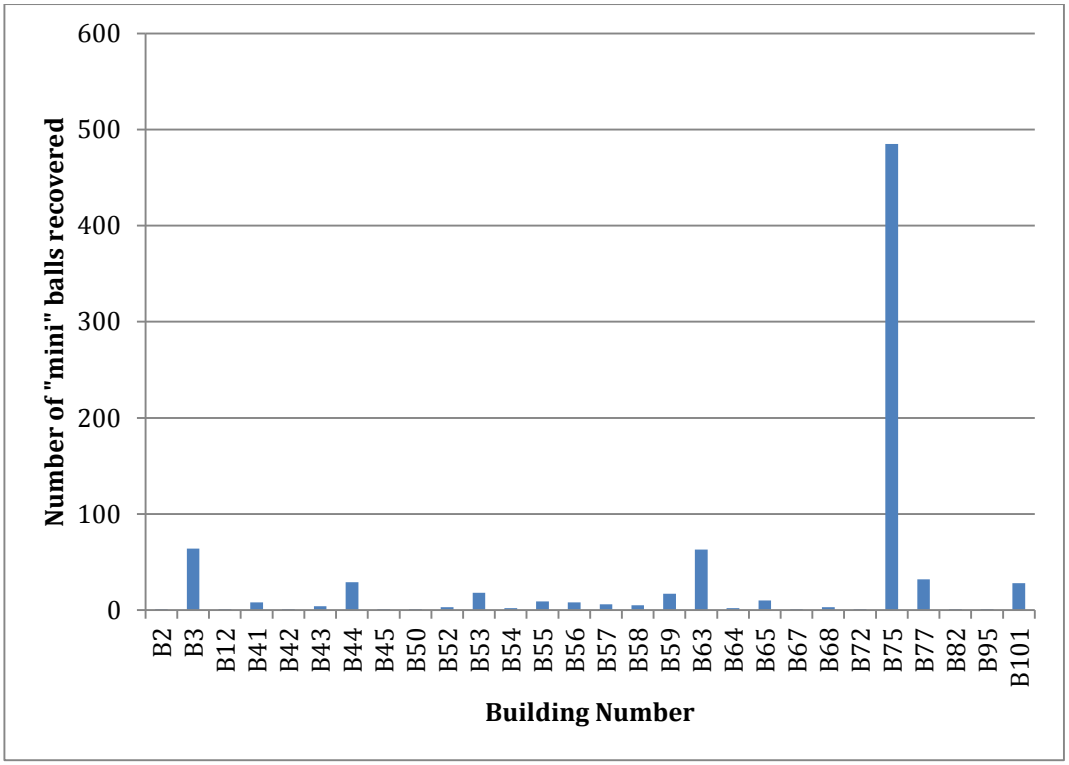


Figure A.D-3: Number of "mini" ball classified objects found in each building (from the total of 1,242 site classified "mini balls", 742 of which were found in buildings.

Figure A.D-4: Example of one of the stone spheres (photographed from three angles) from Çatalhöyük's groundstone selection. CO# 2688. (Photographs: author's own).

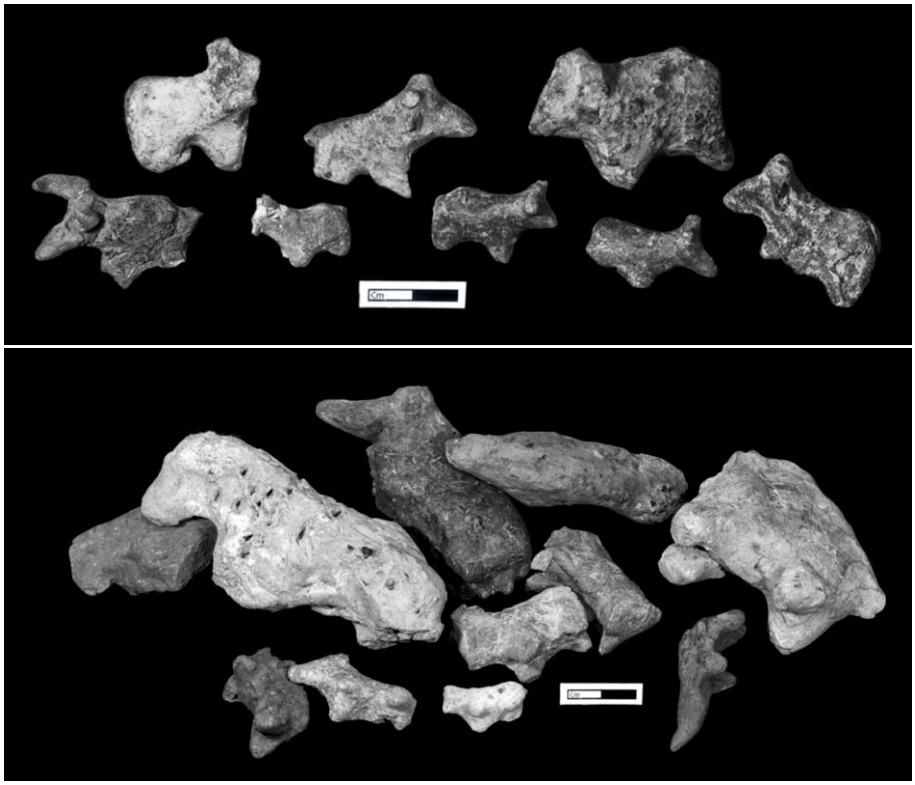


Figure A.D-5: Selection of quadruped zoomorphic figurines from Çatalhöyük. (Meskell & Nakamura 2013: fig. 12.2 p. 202 and fig. 12.24 p. 222).

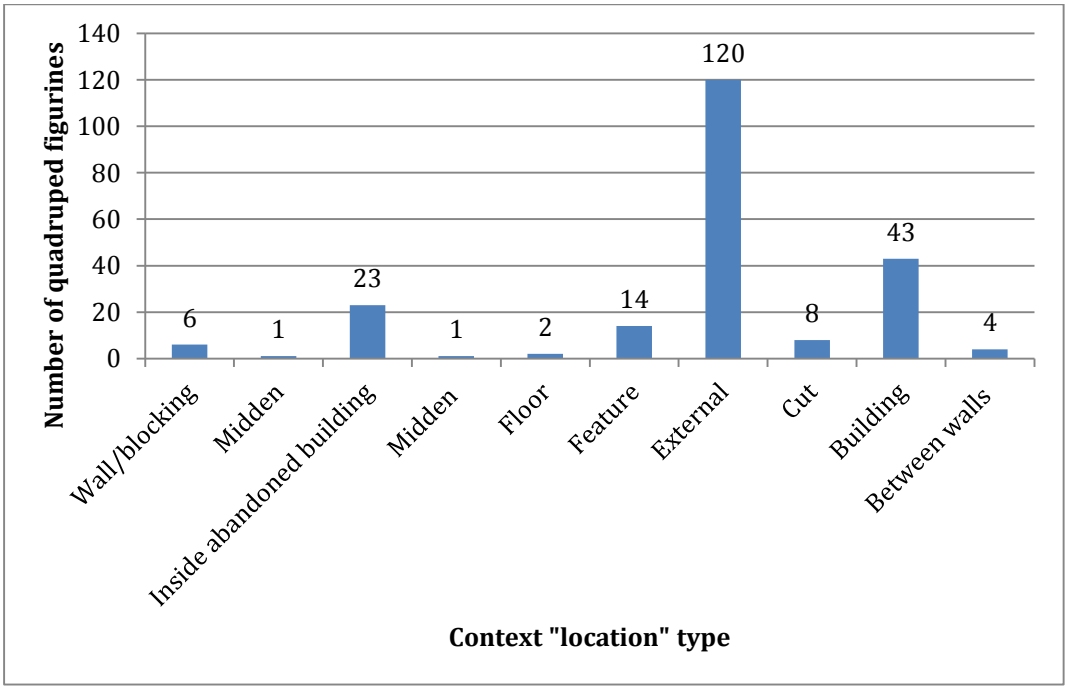


Figure A.D-6: The "location" of the 296 definite "quadruped" figurines from Çatalhöyük as recorded on the sites' context database.

TABLES

LOCATION	NUMBER OF "MINI" BALLS
Building	599
External	453
DATA CATEGORY	**NUMBER OF "MINI" BALLS**
Midden	470
Cluster	422
Fill	179
Construction/make-up/packing	105
Floor	89
Activity	37
Arbitrary	17

Table A.D-1: Location and context (*Data Category)* of all "mini" balls recovered from Çatalhöyük (recorded at both tier 1 and tier 2 level).

BUILDING NUMBER	NO. OF "mini balls"	BUILDING NUMBER	NO. OF "mini balls"
2	*1*	**57**	*6*
3	*64*	**58**	*5*
12	*1*	**59**	*17*
41	*8*	**63**	*63*
42	*1*	**64**	*2*
43	*4*	**65**	*10*
44	*29*	**67**	*1*
45	*1*	**68**	*3*
50	*1*	**72**	*1*
52	*3*	**75**	*485*
53	*18*	**77**	*32*
54	*2*	**82**	*1*
55	*9*	**95**	*1*
56	*8*	**101**	*28*

Table A.D-2: Contextual distribution of all Çatalhöyük "mini" ball registered objects (tier 1 and 2 recorded, n= 1,242) within buildings.

SELECTED INTERPRETATIVE CATEGORY	NUMBER OF "MINI BALLS"
Activity surface	3
Animal bone cluster	5
Disturbance	1
Ashy	4
Bin Fill	5
Midden	468
Dump/dumping	37
Burial Fill	9
Burnt Layer	27
Clay Ball Cluster	416

Table A.D-3: Contextual distribution of all Çatalhöyük "mini" ball registered objects (tier 1 and 2 recorded 1,242): selected "interpretative category".

OF THOSE IN BUILDINGS...	NUMBER OF "MINI BALLS"
Midden	35
Room Fill	62
Room backfill	6
Burial/grave Fill	5
General Fill	2
Clay Ball Cluster	416
Burnt Layer	4

Table A.D-4:"Interpretative category" recorded for the context of Çatalhöyük "mini" ball registered objects tier 1 and their 2 recorded 1,242) found inside buildings.

AREA & BASIC PHASE	NUMBER OF QUADRUPEDS	% QUADRUPEDS
South: *Later* Neolithic	53	58.89
South: *Earlier* Neolithic	37	41.11
North: *Later* Neolithic	68	48.92
North: *Earlier* Neolithic	56	40.29

Table A.D-5: Temporal distribution of quadruped figurines by broad chronological phase within the North (4040) and South excavation areas.

APPENDIX E: NOTES ON THE TELL SABI ABYAD METHODOLOGY

TIERS OF OBJECT RECORDING

In 2010, primary study of small geometric clay objects from Tell Sabi Abyad commenced. This was undertaken in person, on site during the summer excavation season. The appearance, craft, and other characteristics of a total of 293 objects were studied and recorded, in full. A second season of primary data collection was planned for spring-summer 2011; however, due to the sudden political instability of in Syria, the excavation season cancelled.

As a case study, a sample count of just 293 was not sufficient to be able to discuss the nature and character of the geometric clay object assemblage from the site with any credibility. By definition, the "Tier 1": *Direct Observation Case Studies* of this research comprise sites where a: complete, or near complete assemblages of all known and excavated small geometric clay objects have been individually studied and recorded, in detail and b: there is access to full contextual data for each and every objects recorded, individually and provided by the project director (see Methodology Chapter 5). Therefore, in order to utilise the Tell Sabi Abyad tier 1 data (n=293), additional geometrics needed to be recorded. All finds from Tell Sabi Abyad are kept in Syria; stored either at the dig house in Hammam-et-Turkman (a village near to the mound), the Raqqa Museum (a large city, around 1.5 hours' drive from Tell Sabi Abyad) or at the off-site storage unit (located just outside of Raqqa). However, with the cancellation of all further work at Tell Sabi Abyad, and in Syria for the foreseeable future (a situation which continues to date), any additional objects had to be recorded at tier 2 or tier 3 level (see Methodology Chapter 5 for tier of recording definitions).

TIER 1: OBJECT SELECTION & METHODOLOGY

The method of data collection is identical to that of Boncuklu Höyük and Çatalhöyük in its methodology; however the selection of objects for studies varies slightly. As with Çatalhöyük, any small, geometric shaped object made of clay, and stone counter parts were sought to be studied and recorded.

Object Retrieval

The aim was to record an arbitrary selection of as many relevant objects as possible, from all excavation seasons and areas of the site; its multiple tells and Neolithic occupation phases, over two or three data collection seasons in Syria. In reality, this was not possible.

[Appendix E]

All clay objects excavated in the 2010 season (from Sabi Abyad III) were studied, as they were immediately accessible, along with their context information and associated objects. Objects stored in Raqqa Museum (the nicer finds from all seasons) were not accessible due to permit problems (plans to access finds stored in the museum were made later on in 2010 and early 2011, yet these had to be aborted along with the 2011 and subsequent excavation seasons). Thus only objects at the storage depot in Raqqa were available for the 2010 recording session.

Figure A.E-1: Selection of "sling missiles" from Tell Sabi Abyad. All are designated sling missiles in the site's records, yet the fourth (bottom right) does not display the same features and was recorded as a geometric clay object or "token". (Left to right: Master File numbers O09-160, O08-140, O09-360, O08-16 and CO #251). Photograph; author's own.

Object Selection

There were many nicer-more unusual, distinctive and creatively geometrically shaped objects which were found amongst the objects <u>not</u> designated as "tokens" at Sabi Abyad (including small geometrics clay objects with the following designations: "labrets", "sling missiles", "disc", "clay disc", "lump", "unknown", "sealing", "worked clay" and "jar

stopper". Common shapes in the "token" designated objects also appear registered as "unknown" and occasionally, fragments as "sling-missile" and were thus recorded a geometric clay objects when recovered. However, these objects are usually clearly distinguished by their distinctive light brown colour, dense and heavy feel, smooth-finely made surface, and distinct oval shape with pointed ends (figure A.E-1).

Figure A.E-2: Typical "plug-shaped" (my terminology) labret found at Tell Sabi Abyad. One of the two main forms of "labret" designated objects from the site. Master File number O09-296 (excavates 2009). Photographs: author's own.

Many cone-shaped objects were registered as "labrets" -which if they did function as labrets-are not relevant to this study. I noted that "labrets" were present in two main forms: cone shaped items (with a round base) and "plug-shaped (figure A.E-2). The latter are easily recognisable by their distinctive features:

- Colour: always dark grey/black
- Finish: very smooth-almost polished appearance and feel
- Form: barrel shaped-circular in plan with narrow body

Despite these distinctive features, these labrets may also be logged as "tokens" or mistaken for other shaped if fragmented or observed with no awareness of the full, original shape. The shape of this object seems consistent with use ad a labret, and as such, this object form was not recorded. Yet many "labret" designated items are simple cone shapes, with no clear function. Others are more distinctive, yet due to the similar form, almost all cone-shaped clay objects are designated "labrets", rather than "token". With

no clear evidence that all cones shaped objects were used as labrets, this designation is problematic. Therefore, except those where the function as labret was clear, many of the "labret" designated objects were recorded as clay geometrics, even those with a slightly flared base or narrowed body.

It should be noted that the objects were selected from only a limited number of excavation seasons and site areas. The site is so large, covers a number of tells, and likely consisted of a number of villages with overlapping occupation periods. The 293 clay objects represent finds from only two excavation seasons and two different areas of the site. As such, this means that an arbitrary and representative sample of all types of small geometrics from Tell Sabi Abyad's four mounds and 1'000 years of occupation is not present.

TIER 2: OBJECT SELECTION & RECORDING PROCESS

The tier 2 assemblage consists primarily of small geometric clay objects recorded from published material. The main publications released by the site's director Peter P.M.M.G. Akkermans and members of the Tell Sabi Abyad project were examined for illustrations or descriptions of individual artefacts. The same object selection strategy was applied. All objects published as "tokens" along with other small clay (or stone) geometric clay objects published under other functional categories, meeting the clay object criteria were recorded; a total of 96 (see table below).

In addition, four (fragmentary) objects were recorded from detailed, unpublished site records which had been retrieved whilst on a study season at the Tell Sabi Abyad project office in Leiden, the Netherlands. The tier 2 objects are not only selective by appearance (with the more aesthetically pleasing of small clay artefacts chosen for illustration in publications), but also area of site; with the majority coming from Level 6 of Operation I on the main tell. Only one publication has illustrations of individual objects excavated from other areas (Akkermans & Verhoeven 2000).

ADDITIONAL INFORMATION SOURCES: TIER 3

Published Data

As only a limited number of objects were individually published, and many publications noted in passing, (lacking individual object numbers, descriptions or illustrations) the presence of higher numbers, or total numbers of "tokens" in particular areas of the site,

were noted separately (by mound, operation and level where applicable) at tier 3 level. These records total 273 objects (see table A.E-1E-). Their lack of individual illustration or description prevents them from full study and by virtue of the data sources, the total of 273 tier 3 objects does overlap to a degree with the recorded object total, as some of the 218 were recorded on the clay object database at tier 2 level. However, they are useful records, as they provide an addition dimension when assessing the recorded objects from a particular area, such as how representative of the entire "token" assemblage the recorded proportion is.

Unpublished Object Records

The tier 3 published count is supplemented by information from the electronic Tell Sabi Abyad finds database (or "Box File"). Again, these objects are not illustrated or described, and therefore cannot be recorded individually. As a record of all excavated artefacts, this total count includes all Tell Sabi Abyad geometrics studied and recorded in person (tier 1, n=293) and recorded from publications (tier 2, n=100) as well as the 273 tier 3 publication objects. The database lists all excavated finds according to the functional designation given by the excavator or on-site finds team, providing a reliable *estimate* of the total number of excavated clay geometrics of 1'535 objects (figure A.E-3. For breakdown see Chapter 8 table 8.1-1 and figure 8.1-1).

There are some considerations to made however; since some of these 1'535 records cover groups of objects (groups of 2 to 20/30+), while others are only single objects. In addition, the total number is reliant on the accurate and consistent assignment of functional object designations, and it is likely that a proportion do not fit the geometric clay object selection criteria, and others that do, are excluded from the total number (by being labelled as a figurine for example). Therefore, filtering this information by mound, level, excavation square and locus-lot may give an inaccurate picture of the distribution of the objects. Contextual analysis was not carried out on these objects, only the objects from tiers 1 and 2. Instead, information from the 273 published tier 3 objects was incorporated into conclusions made from this tier 1-2 contextual analysis where relevant.

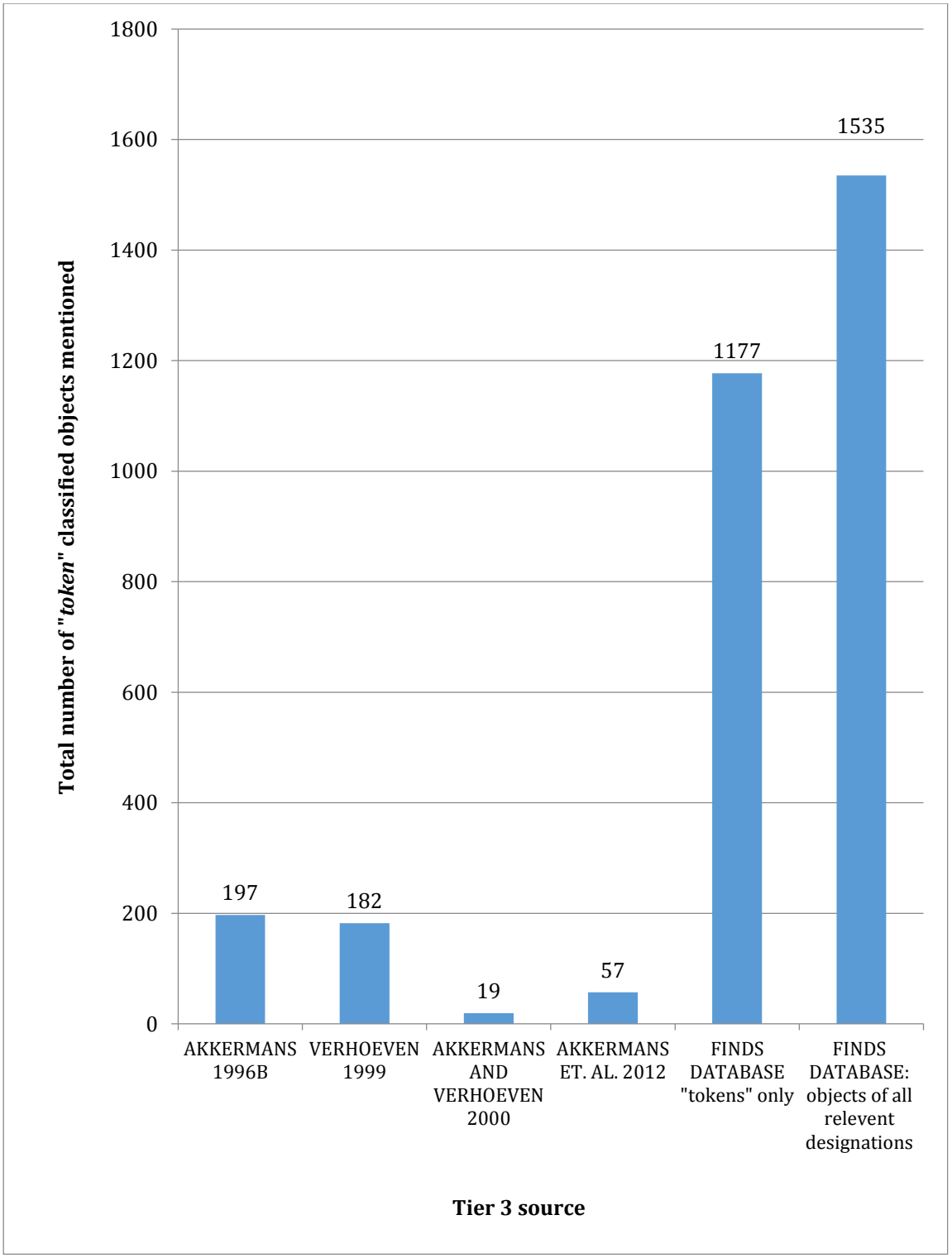


Figure A.E-3: Totals of the tier 3 (generalised references to "tokens") counts by data source.

SOURCE	SITE AREA AND LEVEL/PHASE	
OBJECT DESIGNATION AS PUBLISHED	**"TOKEN"**	**"TOKEN" NOTES**
Akkermans, P. & Verhoeven, M. 1995, "An Image of Complexity: The burnt Village at Late Neolithic Sabi Abyad, Syria", *American Journal of Archaeology,* vol. 99, no. 1, pp. 5-32.	**OPERATION I, TELL SABI ABYAD (MAIN TELL):** Level 6 "Burnt Village"	
	Not quantified	Discussed in detail: interpretation, function and exact context.
Akkermans P.M.M.G. & Duistermaat K. 1996, "Of storage and nomads. The sealings from Late Neolithic, Sabi Abyad, Syria", Paleorient, vol. 22, no. 2, pp. 17-44.	Not mentioned	The "tokens" are not mentioned nor described or quantified.
Akkermans, P.M.M.G. & Duistermaat, K. 2004, "More Seals and Sealings from Neolithic Tell Sabi Abyad, Syria", *Levant,* vol. 36, pp. 1-11.	Not quantified	Referred to in passing only.
Verhoeven, M. 1999, *An Archaeological Ethnography of a Neolithic Community: Space, Place and Social Relationships in the Burnt Village at Tell Sabi Abyad, Syria,* Nederlands Historisch-Archaeologisch Instituut te Istanbul: Istanbul.	**OPERATION I, TELL SABI ABYAD:** Level 6 and 3	
	182	Refers only to the Level 6 "Burnt Village" "tokens" (almost all from Operation I come from Level 6).
Akkermans, P. M. M. G. (Ed.) 1996b, *Tell Sabi Abyad the Late Neolithic Settlement: Report on the Excavations of the University of Amsterdam (1988) and the National Museum of Antiquities Leiden (1991-1993) in Syria Volume II,* Nederlands Historisch-Archaeologisch Instituut te Istanbul: Istanbul.	**OPERATION I, TELL SABI ABYAD. ALSO OPERATION II (MAIN TELL):** all Neolithic levels	
	197	Almost all the "tokens" referred to in this book come from Level 6: "Burnt Village"
	OPERATION I, TELL SABI ABYAD: SUMMARY	
	"TOKENS": A total of **197**; 182 of which come from Level 6 "Burnt Village" (as of 1996).	
	"SEALINGS": A total of **300.** Mostly stamped with stamp seal impressions and mostly from Level 6 "Burnt Village" (see Chapter 9 table 9.1-2 for full detail of the sealings).	
Akkermans, P.M.M.G. *et al.* 2012, "Burning Down the House: the burnt building V6 at Late Neolithic Tell Sabi Abyad, Syria", *Analecta Praehistorica Leidensia,* vol. 43, no. 44, pp. 307-24.	**OPERATION II, TELL SABI ABYAD, SQ. V6:** all levels	
	57	From various levels and rooms within the house in this square.
Verhoeven, M & Akkermans, P. M. M. G. (Eds.) 2000, *Tell Sabi Abyad II: The Pre-Pottery Neolithic B Settlement.* Nederlands Historisch-Archaeologisch Instituut te Istanbul: Istanbul.	**SABI ABYAD II: Tell**/mound **II** *Mainly* The PPNB (Level 8 to 2=PPNB. Also reference to Level 1=PN)	
	19	Published as n=17 (PPNB levels) plus n=2 (Level 1: PN). Other geometrics are mentioned and illustrated (and recorded at Tier 2 level) i.e. the "Game Piece?" and the "Tally?"

Table A.E-1: Published tier 3 "tokens": breakdown of the passing references to, and quantities of clay objects from the main Tell Sabi Abyad publications (up to 2013).

UNRECORDED OBJECT CATEGORIES

Stamp Seals

A number of stamp seals from Tell Sabi Abyad are published. These were not recorded as part of the tier 2 data collection process. No stamp seals were knowingly recorded from any other sites in this study as stamp seals are not its focus. None of the Tell Sabi Abyad stamp seals are made from clay, and examples from Sabi Abyad (and most other sites) are clear in their function as stamps, so cannot be easily confused with clay geometrics.

Sealings & "Jar Stoppers"

Sealings are classified by the Tell Sabi Abyad team as two separate categories:

- "sealings"
    - Defined as objects used to over the opening of a container, or secure a package – that displays the impression of a stamp seal
- "jar stoppers"
    - Objects with the same function, yet plain; lacking stamp seal impressions.

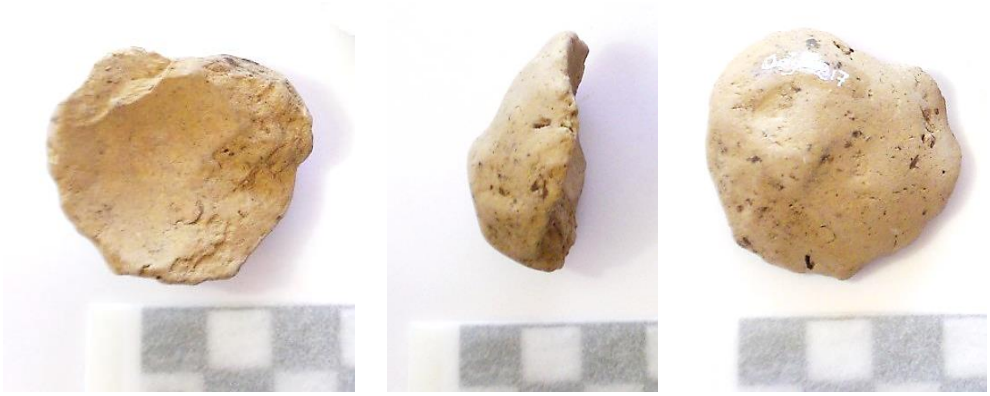


Figure A.E-4: CO#320. Cup shaped clay geometric; a possible clay sealing-cup shaped clay geometric (viewed from the top, base and side). Excavated 2009. Photograph: author's own.

Unlike the other case-study sites, sealings were not sought in the recording of objects from Tell Sabi Abyad. Sealings (and jar stoppers) are extremely common at Tell Sabi Abyad. This combined with their relatively degree of completeness and large fragment size, practically all sealings from Tell Sabi Abyad are immediately recognisable as such, not easily confused with other artefact types. Therefore they tend to be classified as such on-site and separated from the geometric and miscellaneous clay artefacts when

recovered. Additionally, the Tell Sabi Abyad sealings have been extensively studied and published See Chapter 8 table 8.1-2 for totals and references). Therefore, sealings were not sought for study when undertaking data collection on-site. That said however, in order to maintain a consistent recording strategy, if more ambiguous, sealing-"like" objects were encountered during data collection at Tell Sabi Abyad, they were recorded (and marked as such on the database, see figure A.E-4); though it must be recognised that unlike at the other case-study sites where sealings were absent or extremely rare, the number of possible sealings discussed here is not representative of the hundreds of sealings recovered from Tell Sabi Abyad as the number of "likely" sealings is only 8; 2.73% of tier 1 Tell Sabi Abyad objects. No sealings were recorded at tier 2 levels, however, a record of the total sealing count was noted for reference at tier 3 level (Chapter 8 table 8.1-2).

CONTEXT

A detail record of the context of all individually recorded small geometric clay objects from Tell Sabi Abyad was sought (n=393, tiers 1 and 2). At the time of research, the Tell Sabi Abyad site records were not digitised (unlike the context databases of Boncuklu Höyük and Çatalhöyük which were obtained and linked to the *Clay Object Database* in order to carryout analysis of the objects from these sites-according to their context). Therefore, a suitable electronic database was created to store and analyse this information (see Appendix G: Tell Sabi Abyad Context Database and figure A.E-5).

THE TELL SABI ABYAD CONTEXT DATABASE

Information Sources

Leiden-based context recording (tier 1 objects) utilised information from various site records:

- Day Notes
- Feature Forms
- Forms
- Additional plans and sketches

The context of the tier 2 objects was collated from the source from which they have been originally recorded (see the Tell Sabi Abyad Context Database "reference/source" column), with four objects (CO#s2915-2918 recorded from the unpublished site notes, as tier 1 above).

Basic Context Information

Basic information included the year of excavation, the mound or tell ("main" or II, III, see Chapter 4.3 figure 4.3-2) and the area within the tell ("operation") – relevant for the main tell only (Chapter 4.3 figure 4.3-3). All tier 2 publication records are incomplete. For the Tier 1 objects, the excavation square (represented by a letter then a number, which can be located for main tell square only, on the Tell Sabi Abyad site plan, Chapter 4.3 figure 4.3-3). The objects three-dimensional location within its excavation square is documented in the "locus-lot" combination ("lot" numbers are only exclusive when used in association with the "locus" number and "locus-lot" combinations are only exclusive within their specific excavation square.

Stratigraphy

At Tell Sabi Abyad, the elevation of all objects (and the loci and lots within them) is noted. "Strata" are numbered sequentially within each excavation square (beginning with 1 for the upper most level), and later, these strata are assigned to operation (main tell) or tell wide (mounds II and III) stratigraphic "levels". Where possible (objects with a "level" recorded), the cultural phase of objects was ascertained, using the system first published by Nieuwenhuyse *et al.* 2010 (fig. 5 p. 78. See Chapter 4.3 table 4.3-1). For largely unprocessed (at time of study) site records of the tier 1 objects, the stratigraphic level was large unavailable.

As varying levels of stratigraphic detail was available for the studied objects, all of the above categories were recorded on the *Tell Sabi Abyad Context Database:*

- Elevation (maximum and minimum)
- Strata (per square)
- Level (comparable across each operation or mound)
- "Cultural" phase (comparable site wide)

"Primary" Context

"Primary" context is defined as the immediate context of the geometric clay object. Detailed related to an object's primary context are recorded in a series of eight descriptive drop down boxes under this heading (see figure A.E-5). The first four ask questions of the object's find spot (see table A.E-2):

- 1) *Within Fill Material?*
- 2) *Within Building Material?*

- 3) *Location of Context/Area Type*
- 4) *Location within structure/feature/Open area*

The second set of boxes defined the location of the "tokens" within the primary context, using cardinal points. The location of the primary context e.g. the pit, burial, room or find spot (for an open area) within the 10m by 10m excavation square is also noted. Other features within the excavation square, such as buildings, burials, platforms or walls (the type and number) are recorded. Finally, the nature of the sediment from which the object was excavated, and the presence of any inclusions (including but not limited to fragments of animal, ash, burnt early, loam, charcoal, lime plaster fragments of mudbrick debris, seeds or shell) are noted. In addition, building and room numbers if applicable have their own boxes, enabling the easily identification and filtering of objects from specific buildings and rooms.

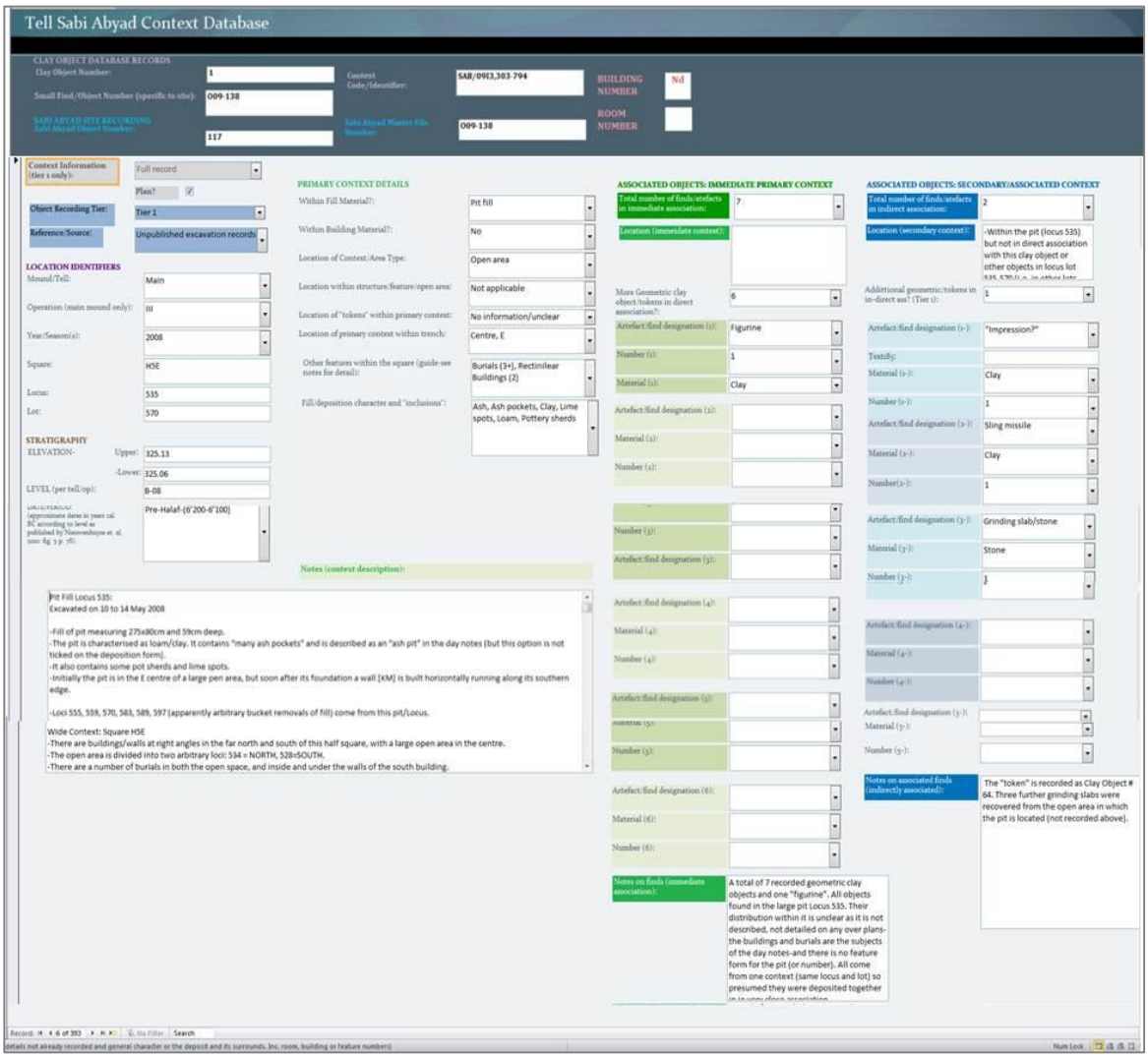


Figure A.E-5: Screen-shot of the *Tell Sabi Abyad Context Database* showing the layout and system of recording.

PRIMARY CONTEXT RECORDING				
QUESTION:	1) WITHIN FILL MATERIAL?	2) WITHIN BUILDING MATERIAL?	3) LOCATION OF CONTEXT/AREA TYPE	4) LOCATION WITHIN STRUCTURE/FEATURE
	Backfill	Daub	Building (or building complex)-storage	Courtyard
	Burial/Grave fill	Lime/gypsum plaster/whiteware	Building (unspecified function/shape)	Ditch
	Courtyard fill	Loam	Building complex (function not specified)	Doorway
	Debris layer FILL	Misc. Clay	Building-"tholos" (round building "Burnt Village" publications)	Floor
	Ditch fill	Mudbrick	Building-domestic (shape not specified)	Oven
	Doorway fill	Mudbrick?	Building-rectilinear ("Burnt Village" publications)	Platform
	Fire place fill	Paving	Building-tripartite	Room
	Floor fill	Pisé	Building-T-shaped	Under floor within room
	Foundation Fill	Stone	Courtyard	Under wall
	Hearth fill	No	Courtyard/open area (unclear which)	Underneath platform/platform foundation
	Jar/vessel fill	Other (detail in notes)	Industrial/production building (or building complex)	Wall
	Kiln fill	No information/unclear	Midden/refuse area	Other (detail in notes)
	Oven fill		Open area	Unclear/not detailed
	Pit fill		Open burial area (entire square)	Not applicable
	Room fill		Passage	
	Storage Bin fill		Pit	
	Other/general fill material (detail in notes)		Possible building (any type)	
	No		Possible/probable open area	
	Not published (tier 2)		Top soil/surface find (unstratified)	
	No information/unclear		Not published (tier 2)	
			Unclear/uncertain	

Table A.E-2: Detail of the recording of the context of Tell Sabi Abyad geometric clay objects under the title of "Primary Context"; questions and options from drop down lists on the Tell Sabi Abyad Context Database.

"Secondary" Context

The large free type "notes" box allows for a detailed description of the primary context of the object to be entered; especially any information not already recorded in the drop down boxes of the "primary context" section (such as burial numbers and MNI for example). In addition, the wider or "secondary" context of the geometric clay object can also be noted here. The secondary context is defined as all areas within the excavation square not in the immediate vicinity of the geometric in question. Thus, the scale varies according to the nature of the context in question. For an object detailed as being found in the northwest corner of a room within a multi-roomed building for example; the secondary context would include all contexts outside of that room. It would also include the rest of the room (the southwest and northeast). For an object found in the centre of a 5m by 5m platform located within an open square, the secondary context would include the edges of the platform and all open spaces around (including any features).

ASSOCIATED OBJECTS

Like a geometric clay objects context within its excavation square, the presence or absence of any other artefacts are recorded on two levels, with identical methods of recording for each:

- *Artefacts in the primary context*
  - Objects recovered in <u>direct</u> and <u>immediate</u> association with the "token(s)"
- *Artefacts found within the secondary context*
  - A specified location or distance from the main geometric clay object and any artefact cluster it forms part of.

For each: the location is first defined, for example a geometric recovered from the northeast corner of the floor of a room:

- *Primary:*
  - Indirect and immediate association
- *Secondary:*
  - All other finds from the floor of the room (if detailed according in the sire records. All finds reported as coming from general room fill would be documented in the "notes" section of the context database)

- Or (if no distinction was made between finds from the floor surface or room fill) all finds from the fill of the room.

For tier 1 objects where there is no plan of the artefact distribution within a square (or the appropriate level(s) within square), descriptions of artefact distributions were used. Where only very vague notes were available, the immediate context was assumed to be devoid of other finds, and the secondary context was taken to be all artefacts from the same locus-lot, or all lots within the same loci (dependent on segment size). These artefacts were recorded from the electronic table of all excavated finds ("Box File"). For each, the total number of additional items labelled as "tokens" was noted. Next, a full detailed break-down of finds according to function designation was made-recording the: artefact designation, raw material and number of finds of that type recovered (see two columns on the right hand side of figure A.E-6).

APPENDIX F: TELL SABI ABYAD ANALYSIS

Additional illustrations from analysis of the Tell Sabi Abyad clay object assemblage (Chapter 8) are presented below.

FIGURES

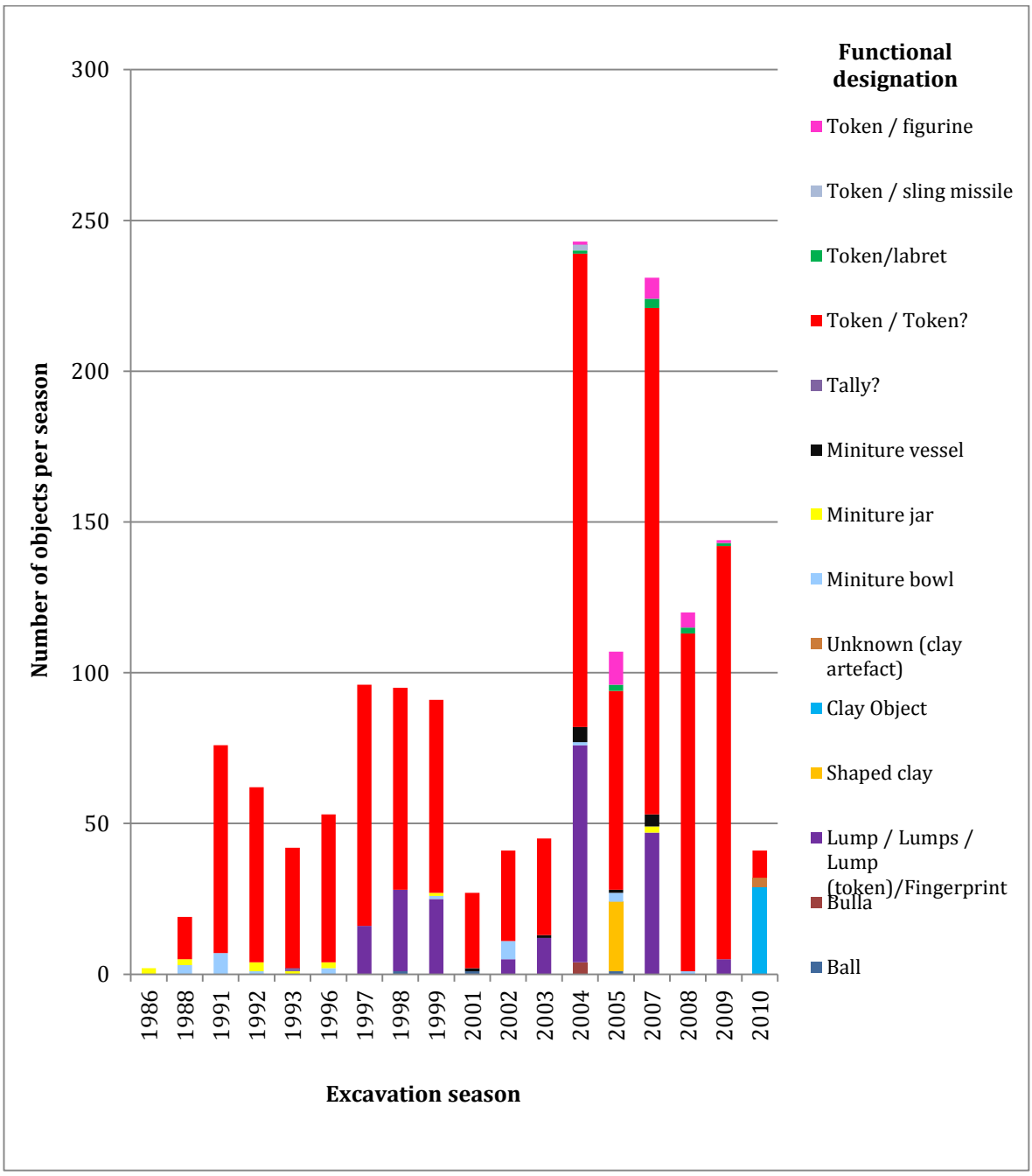


Figure A.F-1: Small geometric clay objects excavated from Tell Sabi Abyad arranged by excavation season; 1986-2010. "Tokens" and objects of similar functional designation, made of clay and less a than 5cm maximum designation were selected from the Sell Sabi Abyad electronic object or small finds database. "Tokens" only total 1,177. All objects combined total 1,535.

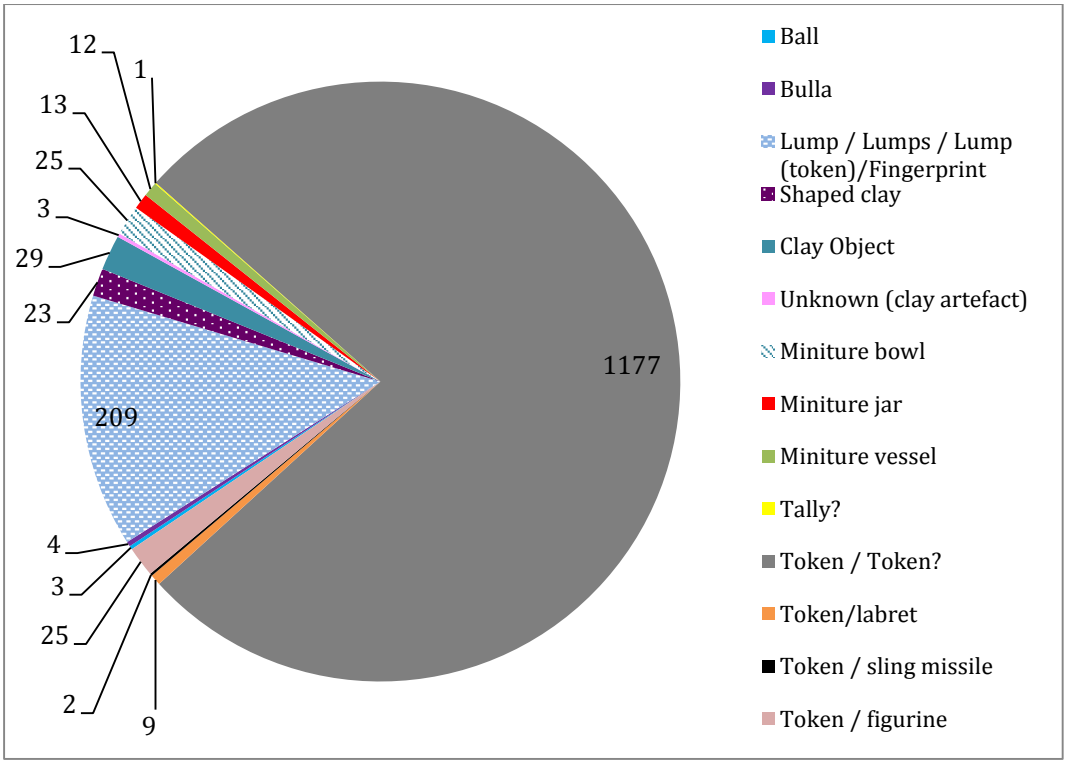


Figure A.F-2: Small geometric clay objects excavated from Tell Sabi Abyad over the duration of work at the site (1986-2010). "Tokens" and objects of similar functional designation, made of clay and less a than 5cm maximum designation were selected from the Sell Sabi Abyad electronic object or small finds database. "Tokens" only total 1,177. All objects combined total 1,535.

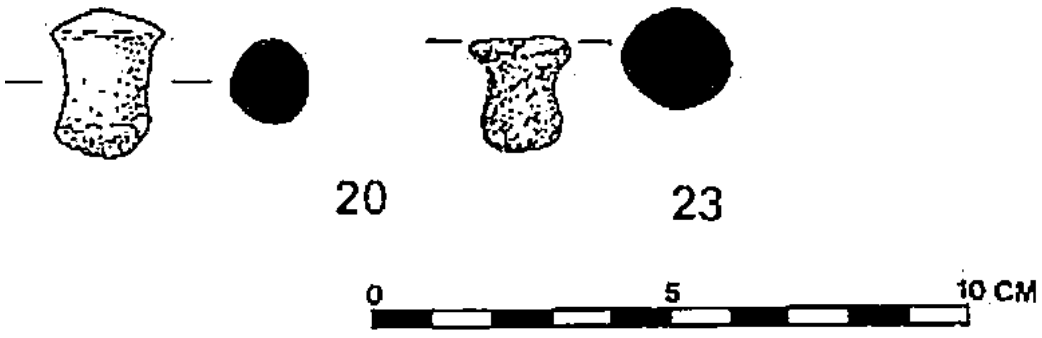


Figure A.F-3: CO#s 2901 and 2902. Two of the "other" shaped objects recorded at tier 2. (Adapted from Akkermans 1996b: fig. 8.9.20 and 23, p. 469).

Figure A.F-4: Tier 1 Tell Sabi Abyad notable objects. Flat "triangle" shaped objects CO#s 187 and 205. (Photograph: author's own).

Figure A.F-5: Tier 1 Tell Sabi Abyad notable objects. CO#56, semi-ovoid with deep marking on the base. Left to right: viewed from the top, section, base. (Photographs: author's own).

Figure A.F-6: Tier 1 Tell Sabi Abyad notable objects. CO# 294. Fragment object covered in markings in the form of carefully arranged fingernail impressions. (Photograph: author's own).

Figure A.F-7: Tier 1 Tell Sabi Abyad notable objects. CO# 256: twisted tear-drop shaped semi-ovoid. **(Top)** plan view, **(middle)** side and base, **(bottom)** side. (Photographs: author's own).

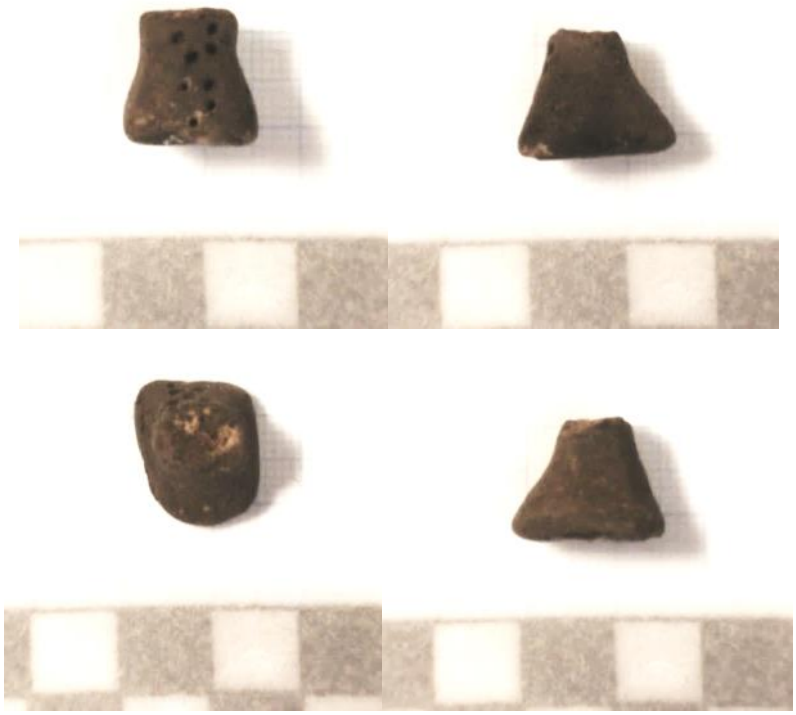
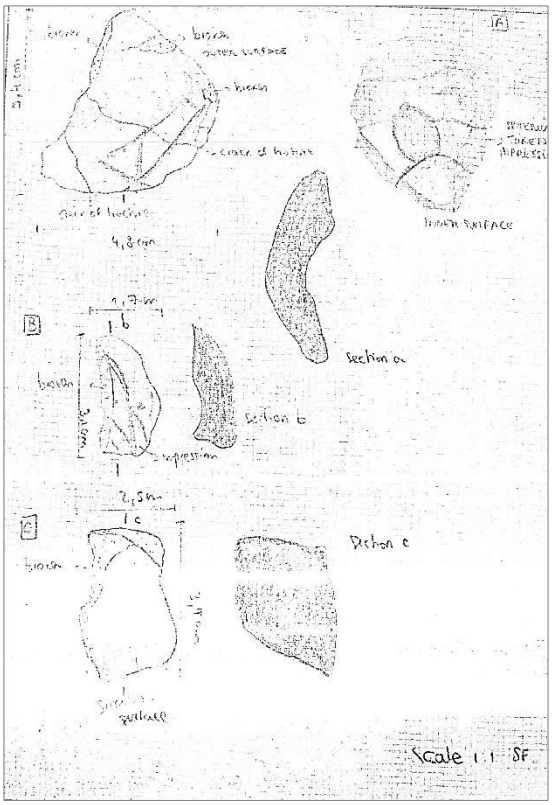
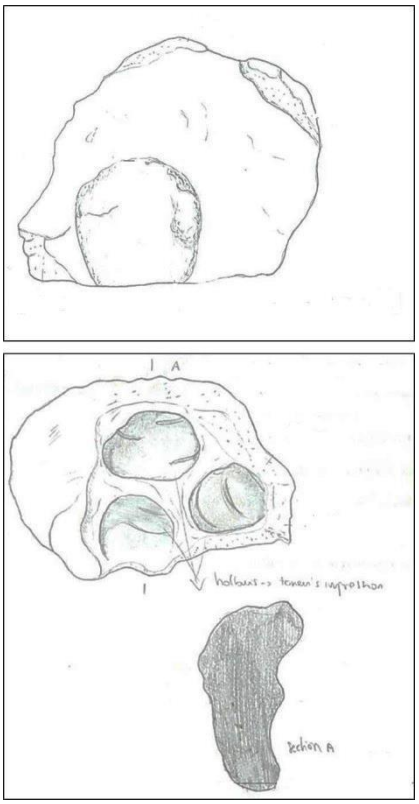


Figure A.F-8: CO# 226, truncated cone with square base. **(Top)** front and back. **(Bottom)** viewed from above (plan view) and base (Photographs: author's own).

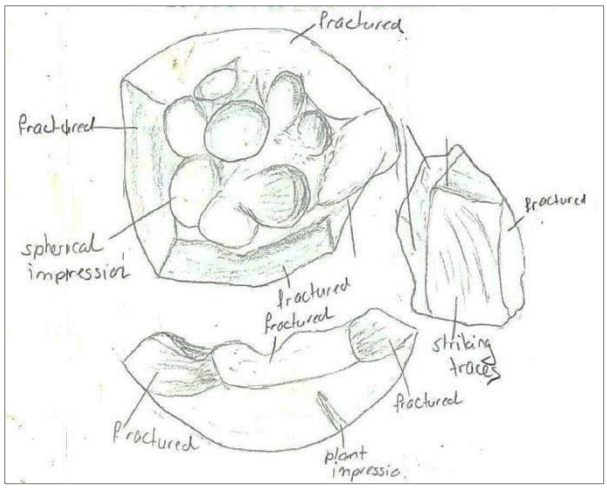
[Appendix F]



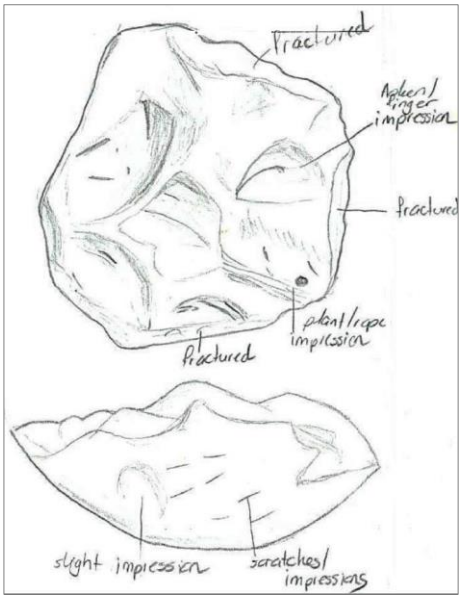
CO# 2916 (MF O04-100)



CO# 2918 (MF Z04-017)



CO# 2915 (MF O04-072)



CO# 2917 (MF O04-118)

Figure A.F-9: Field sketches of the "bullae" recovered from Tell Sabi Abyad operation II, square V6 (2004). CO#s 2916, 2915, 2917, & 2918 (Master File numbers O04-100, O04-072, O04-118 and Z04-017). (TSAEP 1988-2010, courtesy of the Tell Sabi Abyad Project).

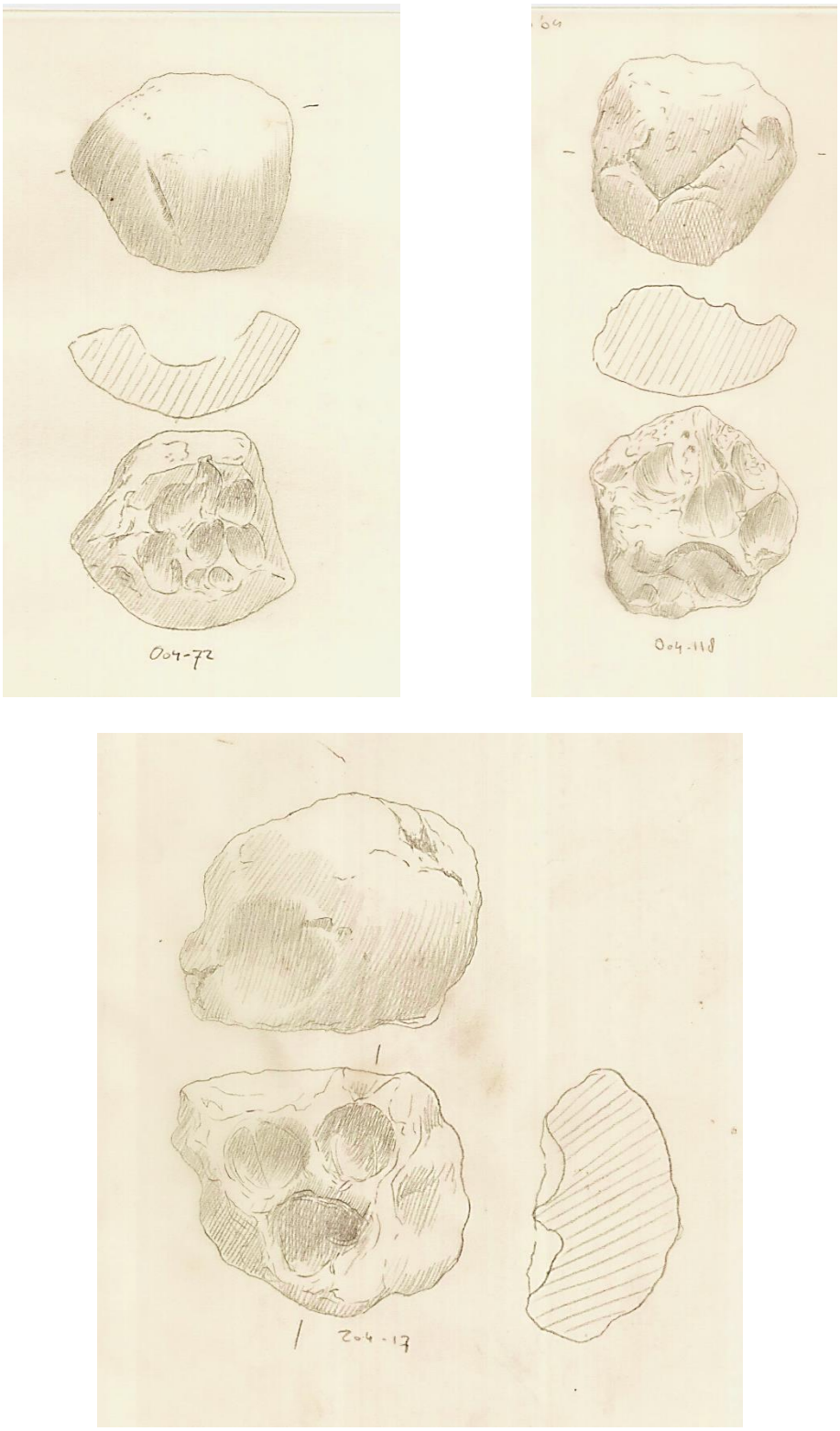


Figure A.F-10: Drawings of the "bullae" recovered from tell Sabi Abyad operation II, square V6 (2004). Left to right, top to bottom: CO#s 2915, 2917, & 2918 (Master File numbers O04-072, O04-118 and Z04-017). (TSAEP 1988-2010, courtesy of the Tell Sabi Abyad Project).

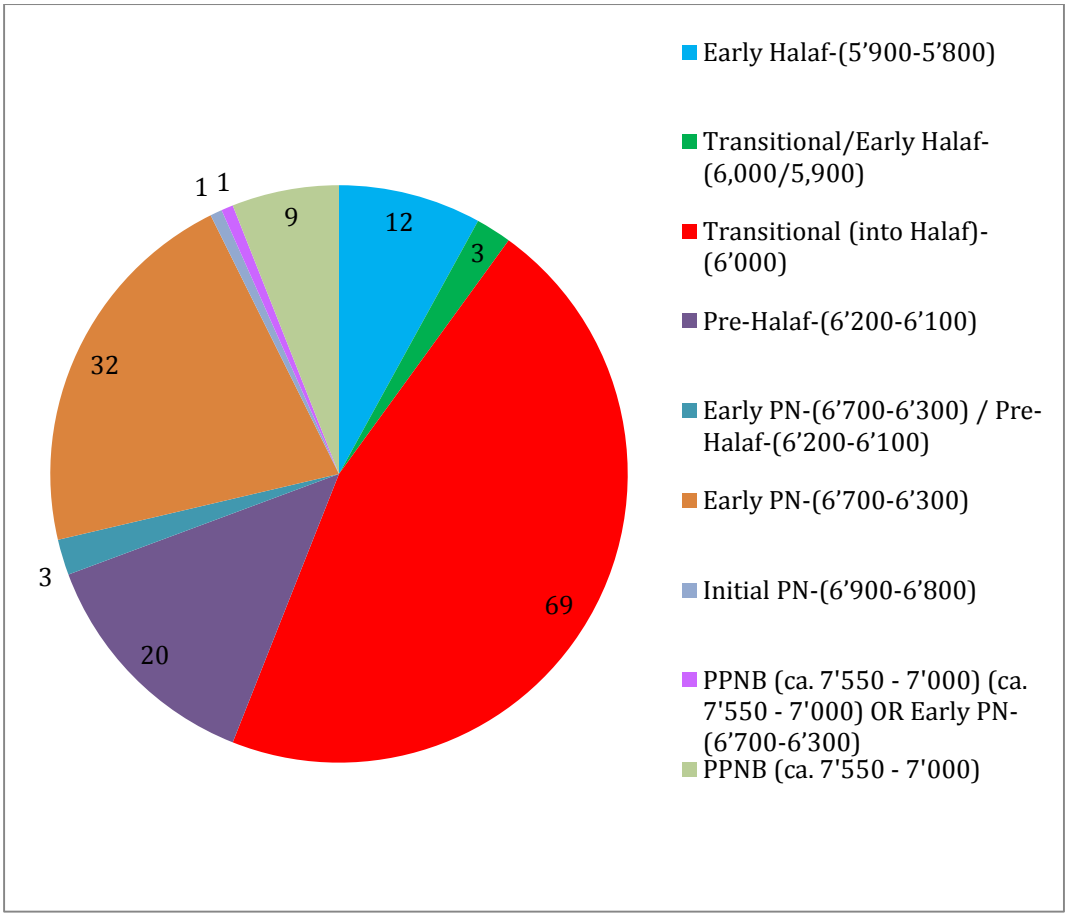


Figure A.F-11: Temporal distribution by detailed cultural phase (as published by Nieuwenhuyse *et al.* 2010: fig. 3 p. 76) of the studied objects. Note: this data was available for n=102/ 25.95% of all recorded objects. Dates are approximate, and in years cal. BC.

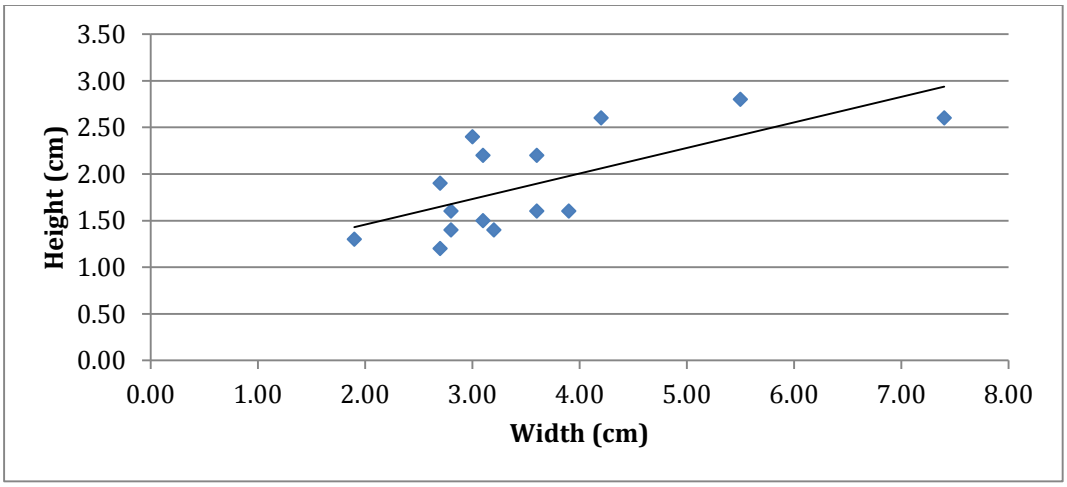


Figure A.F-12: Dimensions and degree of shape and size standardization within the tier 2 "miniature-vessel" clay objects at Tell Sabi Abyad: base maximum width and height.

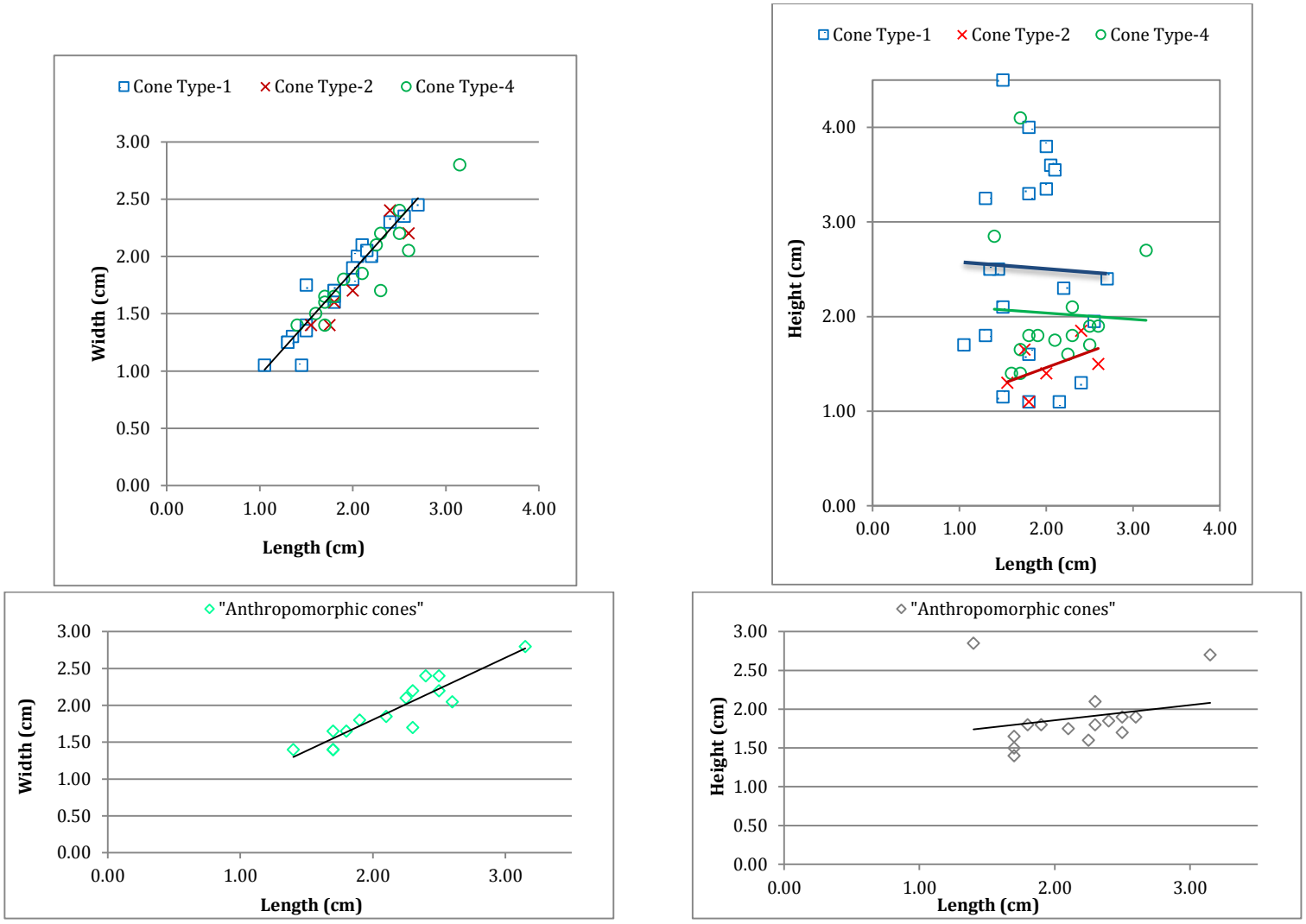


Figure A.F-13: Comparison of dimensions and degree of shape and size standardization within the tier 1 cone assemblage. **(Top row)** all cones by shape sub-types (left: base length and width-base roundness. Right, base length and height). **(Bottom row)** "Anthropomorphic cones" only at Tell Sabi Abyad (left: base length and width-base roundness. Right, base length and height. Also see table A.F-2 for "anthropomorphic cone" details).

TABLES

CO#	CRAFT	SEALING?	APPLIED TO?	"APPLIED TO" ADDITIONAL COMMENTS
270	Applied-2/3d object, moulded/sculpted, rolled	No	Unidentified Item (Possibly)	Applied to create depression on base? Could have used finger or another 3D object. Possible sealing but rest of object is well crafted, no finger marks or depressions so appears to have been made with cone shape highest importance-not as a sealing
228	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Possibly)	Base flat and has one plant marking on the side. Otherwise no distinctive markings.
317	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Possibly)	Base has no diagnostic markings
253	Applied-2/3d object, moulded/sculpted, rolled	Maybe	Unidentified Item (Possibly)	Base is flat as if moulded on a flat surface. Also has a shallow groove through it-perhaps then applied to a 3D object, possibly as a sealing?
95	Defined base moulded/ flat, moulded/sculpted	No	Unidentified Item (Possibly)	Base is flat but had a rough surface, created/dried on a rough surface.
85	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Possibly)	Base is flat but surface is bumpy as if placed on an irregular surface. Perhaps crafted and dried on a marking surface
258	Applied-2/3d object, defined base moulded/ flat, moulded/sculpted	Maybe	Unidentified Item (Possibly)	Base is flat yet has two deep (0.30 and 0.40cm), circular depressions-0.50cm apart and 2.00cm wide combined. Top of object is undecorated (aside from the deep circular hole) and object has lots of evidence of moulding in form of fingertip depressions on t
102	Defined base moulded/ flat, moulded/sculpted, rolled	No	Unidentified Item (Possibly)	Base is very uneven, especially compared to the smooth surface of the rest of the object
327	Applied-2/3d object, moulded/sculpted, rolled	No	Unidentified Item (Possibly)	Both sides have identical decoration. Top is convex. Base slightly concave as if applied to a curved surface?
72	Entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Possibly)	Either moulded on and dried on an uneven surface (i.e. Rough ground or matting or applied to a container or something else as a sealing-yet small and marked surface is flat-unclear what it could seal
60	Entire object applied-flat surface, moulded/sculpted	No	Unidentified Item (Possibly)	Markings are on the top surface only-the other side is more convex hinting that it was perhaps applied to a flat surface (possibly an object) and the markings are from that, not applied as decoration-yet markings are irregular-not from a mat or basket et
320	Applied-2/3d object, moulded/sculpted, rolled	No	Unidentified Item (Possibly)	Possible sealing? Object is fragmented around all sides, deep depression in centre/cup shaped. Used to cover a storage vessel/container? Or placed inside the opening of a jar?
41	Entire object applied-flat surface, rolled	No	Unidentified Item (Definitely)	

42	Entire object applied-flat surface, rolled	No	Unidentified Item (Definitely)	
313	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Definitely)	Base is covered in faint plant markings.
239	Applied-2/3d object, moulded/sculpted, rolled	Maybe	Unidentified Item (Definitely)	Base of object has two, deep, parallel grooves. Each is identical and perfectly rounded. A taller ridge divides them. Inside the grooves is a set of shallow but clear, tiny parallel lines, running in the same direction as the groove. Unclear what causes t
318	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Definitely)	Both base and top are flat (base more defined). Both surfaces have plant markings
314	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Definitely)	Completely flat base but no markings
254	Applied-2/3d object, moulded/sculpted	Definitely	Unidentified Item (Definitely)	Deep groove runs the length of the object from the top to more than half way down past the core of the object. Cylindrical groove but no impressions inside-unclear what it was applied to.
311	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Definitely)	Entire object is cracked yet clay surface is very smooth. Base has no markings aside from 2/3 shallow plant impressions.
219	Moulded/sculpted, rolled	No	Unidentified Item (Definitely)	Entire surface and both sides (reverse side-with depressions clearer) covered in tiny lines-looks like finger prints but under magnification appears to be tiny parallel lines running top to bottom (if object is placed width left to right). For decoration?
276	Applied-2/3d object, defined base moulded/ flat, moulded/sculpted, rolled	Probably	Unidentified Item (Definitely)	Object definitely applied to a curved object to create the resulting-current shape. Entire object is curved but he base is still smooth with very faint markings in the form of narrow, tightly spaced parallel lines. Incorrect shape to plug a jar-be used as
281	Applied-2/3d object, moulded/sculpted, rolled	No	Unidentified Item (Definitely)	Object has deep arch on underside-only half of this from centre to edge of one side remains-nearly a 90 degree angle between the two under surfaces. Base has very faint markings exactly what this object was applied to is unclear.
221	Defined base moulded/ flat, entire object applied-flat surface, rolled	No	Unidentified Item (Definitely)	Plant/straw-irregular pattern covering entire base only.
284	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Unidentified Item (Definitely)	Top has a regular, smooth curve; base is defined flat with part pulled up so seems object was applied to a flat-not curved surface-but one with a protrusion as the base and the top each have a have deep hole in the centre.
322	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted	No	Unidentified Item (Definitely)	Unclear what surface object was moulded on as both sides have identical plant impressions.
260	Applied-2/3d object, defined base moulded/ flat, moulded/sculpted	Probably	Pottery Vessel (Possibly)	Base has a rounded, deep depression-applied to a jar top as a sealing? Rest of object is moulded, smooth but shapeless.
257	Applied-2/3d object, defined base moulded/ flat, moulded/sculpted, rolled	Maybe	Pottery Vessel (Possibly)	Fragment of object so difficult to discern if used as a sealing but shape suggests as much-used to seal a jar?

275	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Other-see next column	Base flat-applied to a surface but identical markings on the top surface too-which is slightly convex.
279	Defined base moulded/ flat, moulded/sculpted, rolled	No	Other-see next column	Entire object covered in plant markings. Both base and top are completely and evenly flat.
277	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Other-see next column	Flat base but no diagnostic markings. Base markings are short (up to 0.50cm) and narrow slits-from inclusions, not the surface object was placed on/applied to.
274	Defined base moulded/ flat, moulded/sculpted, rolled	No	Other-see next column	Flat base, no markings apart from a few small holes-plant inclusions.
278	Moulded/sculpted, rolled	No	Other-see next column	Flat base, sharp, defined edges and convex top. Markings on top and base are identical-for decoration rather than as a consequence of craft?
222	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Other-see next column	Markings on base look more deliberate than accidental as cover only 2/3 of base, and are deep, well defined and seemingly incised, not impressed lines.
123	n/a	No	Other-see next column	May have been rolled over an uneven surface in order to create he markings all over the object
230	Applied-2/3d object, moulded/sculpted	Maybe	Other-see next column	Possibly used as a dealing and applied to a rope? Base has markings and a convex space between the two circular parts.
236	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted	No	Other-see next column	Probable plant markings on base, similar but less clear on top.
105	Applied-2/3d object, defined base moulded/ flat, moulded/sculpted, rolled	No	Other-see next column	Rather than being applied, an object has been applied to the "token" (i.e. A stamp seal?) creating the impressions on either side
264	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted	No	Other-see next column	Surface for working-Base has no impressions aside from on, deep plant impressions (0.15cm) in contrasted to the top surface.
266	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Other-see next column	Very flat base but no only faint-unclear impressions on base aside from a finger print.
67	Entire object applied-flat surface, moulded/sculpted	No	Mat (Possibly), Unidentified Item (Possibly)	Too small to seal anything
215	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted, rolled	No	Basketry (Possibly), Other-see below	Very clear, small (and seen for the 1st time from SAB material) regular impressions on base-defined parallel lines with cross-hatching aligned to the main lines in-between. Looks like basketry but too small. Leaf of some sort acting as a drying surface a
131	Defined base moulded/ flat, entire object applied-flat surface, moulded/sculpted	No	Basketry (Possibly), Mat (Possibly), Unidentified Item (Definitely)	Entire disc covered in plant like impressions, on both sides (one is flat the other slightly concave).

Table A.F-1: Detail of the 43 objects within the tier 1 Tell Sabi Abyad assemblage which have been applied to another two or three-dimensional object or surface.

CO#	OBJECT NUMBER	COMPLETENESS	3D SHAPE	PLAN VIEW SHAPE	COMPLETE SHAPE IN PLAN?	DEPRESSIONS?	PLAN VIEW-LENGTH (CM)	HEIGHT/THICKNESS (CM)	MARKINGS	FINGER PRINTS	HEAVY WEAR?	ADDITIONAL COMMENTS:
109	O09-43	75 to 99	Cone 4	Type-g, regular	Yes	None	3.15	2.70	None	1	Base very worn.	Variation of a cone shape. Very similar in shape to CO#s 109, 114, 129, 130, 137, 158, 203 and others.
114	O09-38	75 to 99	Cone 4	Type-a regular	Yes	Base	2.30	1.80	Applied decoration in the form of circular pieces of clay, applied and incised with a straight line the length of the circle. Placed in a ring around all sides near the base: 16x (only 7 remain intact, scars of others visible. 1 fingernail impression also.	None	Heavily worn all over hence half of the decorative elements have fallen off.	98% complete, chipped at top only and missing some of the added decorative elements from the sides. Very similar in shape to CO#s 109, 114, 129, 130, 137, 158, 203. Applied decoration in the form of circular pieces of clay, applied and incised with a straight line the length of the circle. Placed in a ring around all sides near the base.
129	O09-351	75 to 99	Cone 4	Type-c regular	Yes	Base	2.30	2.10	Applied decoration in the form of circular pieces of clay, applied and incised with a straight line the length of the circle. Placed in a ring around all sides near the base: many (total unclear and only 3 remain intact).	None	Worn all over, especially base and around the sides where most of the decoration has fallen off.	Very similar in shape to CO#s 109, 114, 129, 130, 137, 158, 203. Applied decoration in the form of circular pieces of clay, applied and incised with a straight line the length of the circle. Placed in a ring around all sides near the base.
130	O09-44	75 to 99	Cone 2	Type-a regular	Yes	Base	2.40	1.85	None	None	None obvious	Almost complete, circular based cone, only tip of the top point is missing, and a tiny part on one side of the base.
137	O09-53	100	Cone 4	Type-a regular	Yes	None	1.80	1.80	One single "v" shape, perhaps recent. Is a light groove in the clay.	None	Entire surface evenly worn	Very similar in shape to CO#s 109, 114, 129, 130, 137, 158, 203.

150	O09-45	50 to 74	Cone 4	Type-a regular	Yes	None	1.40	2.85	Two sets of decoration: group 1) applied decoration in the form of incised, circular pieces of clay, placed in a ring around all sides near the base. Group 2) one "L" at top, long vertical line on right, curved line on left and triangle at bottom. All small, faint and applied with a reed/plant stylus in strokes.	None	Entire object is very worn. Decoration lost.	-75% complete. Is the top section of a circular base cone. Identical decoration to many other examples (applied circles).
158	O09-112	100	Cone 4	Type-g, regular	Yes	Base	2.60	1.90	None	None	Worn all over, especially the base	Very similar in shape to CO#s 109, 114, 129, 130, 137, 158, 203.
183	O09-89	75 to 99	Cone 4	Type-a regular	Yes	Base	2.50	1.70	Applied decoration in the form of circular pieces of clay, applied and incised with two, not the usual single straight line down the length of the circle. Placed running down the front, not around the base of the object. Scars from others visible.	None	None obvious	98% complete, chipped at top only and only 1 circular and incised decorative discs remaining-on front not side of object (many one missing but scars visible). Very similar in shape to CO# 114 & 129.
203	O09-229	75 to 99	Cone 4	Type-e, regular	Yes	Base	2.25	1.60	Applied decoration in the form of circular pieces of clay, applied and incised with a single straight line down the length of the circle. Placed in a ring around all sides near the base.	None	Entire objet is heavily worn.	99% present. Top is missing on all similar examples but appears to rise up from the main body, possibly being the head of a figurine-however this object is near complete; with a v. Short "stalk" suggests perhaps all are indeed "tokens". All very similar shape to other examples. The more intact examples suggest these are not figurines after all but “tokens”: (i.e. CO#s 109, 114, 129, 130, 137, 158, 203).
208	O09-67	100	Flattened/semi-sphere	Type-e, regular	Yes	2 sides, base	1.70	1.50	None	None	None obvious	Triangular based pyramid type object, top pulled up and pinched together with three fingers to create shape. Very similar to those with distinct applied and incised circles for decoration: (e.g. CO# 114, 129, 150, & 203).

209	O09-337	75 to 99	Cone 4	Type-a regular	Yes	2 sides	1.70	1.65	None	None	None obvious	99% present. Convex, circular base, rounded body pulled up (depressions on sides) to a point-tip off centre, of which is lost. Cone shaped but with fat, rounded body, not slim with straight sides. Bears strong similarity to similar objects Inc. those with distinct applied and incised circles for decoration: (e.g. CO# 114, 129, 150, & 203).
226	O10-82	75 to 99	Cone 4	Type-d irregular	Yes	None	1.70	1.40	Back of object is decorated with 2 rows of 4 incised circles/holes running from to bottom down the centre. They are not evenly spaced. Possibly more as top of object is missing.	None	None obvious	Similar but not identical form to other similar objects (such as CO#114). Base is square-rounded at one side only. Top is cone shaped with 4 sides. Top is missing. Back has 2 rows of 4 incised circles/holes running from top to bottom.
272	O08-24	75 to 99	Cone 4	Type-c regular, type-g, regular	Yes	4 sides	2.50	1.90	Scar only: faint traces of previous decoration-depressions from the applied circles of incised clay around the sides.	None	Entire object is heavily worn.	). Rounded/oval base, top is pulled up narrows-off centre. Top 5-10% missing on this and all other examples of this form examined to date.
273	O08-171	75 to 99	Cone 4	Type-a regular	Yes	Base	2.10	1.75	Scars only: faint traces of previous decoration-depressions from the applied circles of incised clay around the sides.	2-3 finger prints visible on the sides of the object.	Entire object evenly and heavily worn	Rounded/oval base, top is pulled up narrows-off centre. Top 5-10% missing on this and all other examples of this form examined to date.
325	O10-221	100	Cone 4	Type-b irregular	Yes	2 sides, base	1.90	1.80	None	None	None obvious	Nearly complete, chipped at tip of top only. 99% present. No decoration (or scars in sides from lost decoration).

Table A.F-2: Notable objects from Tell Sabi Abyad tier 1: the 15 “anthropomorphic cones”.

CO#	105
OBJECT NUMBER	O09-233
DEGREE OF COMPLETENESS	75 to 99%
THREE-DIMENSIONAL SHAPE	DISC 2 (flat base)
PLAN VIEW	TYPE-A Regular
SECTION VIEW	TYPE-2, Irregular
SECTION-VIEW COMMENTS	Base stands flat with a concave marking, yet the sides curve up slightly making it Type-2 not a flat Type-4. Entire object thicker at one side than the other
LENGTH	2.8 cm
WIDTH	2.6 cm
THICKNESS	1.8 cm
CIRCUMFERENCE (PLAN VIEW)	8.6 cm
WEIGHT	5.6 g
CLAY COLOUR	Mid-Brown
BAKED?	Yes
CLAY TEXTURE	Fine
ORIGINAL SURFACE FINISH	Very Smooth
AREAS OF HEAVY WEAR?	None Obvious
ADDITIONAL COMMENTS	Flat disc in 2 pieces. Distinct circular impression on each side, in the centre-top is plan circle, base is the same but also has other markings/impressions in it-Appears to have been 2x stamped with a stamp seal.

Table A.F-3: Notable objects from Tell Sabi Abyad tier 1: CO# 105; the stamped disc. Summary of object information.

MARKINGS: OBJECT COVERAGE	LOCATION DETAIL	CLARITY	DEPTH (CM)	TECHNIQUE	TOTAL NUMBER	ADDITIONAL COMMENTS
100-75%	Stamped on both sides, covering almost the entire object	Very Clear	1.15	Impressed	2	Object has two stamp seal impressions: one on the base, one on the top (recorded as Type-7). Both are circular and the same, aside from the base impression is deeper. Both contain a distinct design in the form of three sets of parallel zig-zag lines.

Table A.F-4: Notable objects from Tell Sabi Abyad tier 1: Detail of the markings found on CO# 105 (Master File number O09-233); the stamped disc.

LEVEL OF OBJECT RECORDING	NUMBER OF OBJECTS	TIER DETAIL	OBJECT MORPHOLOGY RECORDING	CONTEXT OF OBJECTS: LEVEL OF DETAIL AVAILABLE:
Tier 1	293	Viewed in person	Full	Extensive to partial.
Tier 2	100	Object morphology recorded from publications (or from unpublished site notes: 4 objects).	Limited	Varies from extensive to moderate. (Dependent on publication).
Tier 3	273 1535	General published literature Electronic object list ("box file")	None (individual objects not studied or recorded).	Published sources (n=273 objects) no information for specific, individual objects. Limited information (tell, level and/or cultural) for some groups of published objects.

Table A.F-5: Number of Tell Sabi Abyad objects studied according to their tier of recording, along with the level of detail available with regards to the context.

AREA	NUMBER OF OBJECTS STUDIED (TIERS 1 &2 COMBINED)	PERCENTAGE OF STUDIED OBJECTS
Tell Sabi Abyad (main Tell), operation I	86	21.88
Tell Sabi Abyad (main Tell), operation II	4	1.02
Tell Sabi Abyad (main Tell), Operation III	275	69.97
Sabi Abyad II (Tell II)	10	2.54
Sabi Abyad III (Tell III)	18	4.58
TOTAL	**393**	**100**

Table A.F-6: Distribution of the studied (tiers 1 and 2) objects from Tell Sabi Abyad by: tell, and by operation within the main tell.

CO#	NOTES (CONTEXT DESCRIPTION)	LOCATION (IMMEDIATE CONTEXT)	TOTAL NUMBER OF FINDS/ARTEFACTS IN IMMEDIATE	NOTES ON FINDS (IMMEDIATE ASSOCIATION)	LOCATION (SECONDARY CONTEXT)	TOTAL NUMBER OF FINDS/ARTEFACTS IN INDIRECT ASSOCIATION	NOTES ON ASSOCIATED FINDS
109	-Locus covers an area of 73 x 84cm -Plan, however this object and locus 496 is not plotted on it. Open area with a tholos in the centre south. Found with objects 36 (CO# 130) and 38 in the same loci yet distribution unclear.	In deliberate and direct association	None	n/a	Unclear location. Yet two objects are recorded as being in the same locus.	2	A stone artefact of unknown function (no. 38) and another "token" CO# 130 (no. 36/MF O09-044).
114	Locus 263-Arbitrary Soil Layer-Excavated on 3 May -Within an open area containing a fire pit. -Characterised as loam/clay, ash and burnt earth with many inclusions. -Covers an area of 6.25 x 5.00m -Arbitrary area in the NE of the double square.	In deliberate and direct association	None	n/a	Within a close radius (1-2m) of this object.	None	n/a
129	Locus 252-Floor Context-Feature EU -The actual floor fabric, from the room which is created by walls: [EX], [EB], [EC], [ED]. -Measures 242 x 95cm max. Wider Context: -The square comprises on building complex-There is a rectangular shaped building in	In deliberate and direct association	None	n/a	No other objects are found in the floor structure, but many are in the room fill itself (locus 238).	13	No other objects are found in the floor structure, but many are in the room fill itself are round: 2 stone vessels, one token, 1 stone axe, 4 stone grinding slabs, 2 hammer stones, 1 sharpening stone and one stone palette.
130	-Locus covers an area of 73 x 84cm -No other objects found in this locus. Open area with a tholos in the centre south. Found with objects 37 (CO# 109) and 38 in the same loci yet distribution unclear.	In deliberate and direct association	None	n/a	Unclear location. Yet two objects are recorded as being in the same locus.	2	A stone artefact of unknown function (no. 38) and another "token" CO# 109 (no. 37/MF O09-043).
137	Room Fill- Measures 2.5x1.85m Contains many silica imprint, and a small number of burnt grains. Is located in the area east of wall [BX] and north of wall [BW] The room is in the SE corner of the square.	In deliberate and direct association	unclear	n/a	In the same corner of this room-in the SW corner.	3	Within this room a number of objects are found clustered together in the SW corner (no's 56, 57, 59). All three are complete and include a sling missile, spherical token and ceramic cup. Frequent pottery sherds and animal bone inclusions are also in the fill of

							this room. In other rooms small numbers of items are found, dominated by grinding stones.
150	Locus 566-Open Area Fill-Excavated on 3rd-4th May -characterised as a loam/clay open area fill. -Contains many lime spots. -Covers an area of 300 x 600cm Wider Context -The square has three rectilinear buildings-or a complex of buildings	In deliberate and direct association	1	SF no. 43 sits immediately next to the "token".	Within a 2m radius.	4	CO# 241. Described as a dagger ("probably bronze") SF'# 40, a rim fragment of a grinding slab (no. 41) and a fragment of a conical token (no. 44). CO# 241 was also recovered nearby.
158	Locus 264 –"Open Area Containing Many Hearths"-possible courtyard -Excavated over a long time period during May 2009 -(Excavated as a double trench so 20m wide x10m long approx.). Open Area locus 241 -Open area measures 725 x 575 cm (no depth measurement)	In deliberate and direct association	None	n/a		1	Object no. 96: fragment of a pierced stone pendant.
183	Locus 254-Room Fill-Excavated 10 May -Room fill, beige loam and clay fill -Covers an area of 275 x 275m -Is the largest western room of the building in the south of H4I4. Wider Context-Square H4/I4 10 May -The object is located in the south central area of the square.	In deliberate and direct association	None	n/a	Within the same room-fill of locus 254-all lots.	5	Objects -Object numbers 68 AND 69 ARE LOCATED SIDE BY SIDE, THOUGH NOT IN DIRECT ASSOCIATION. Within the room-locus 254 are 5 objects: 1 stone axe (no. 68), two clay figurine fragments (no. 64 7 67), 1 stone grinding slab (no. 69) and one misc. clay item (no. 65).
203	No Deposition Form. Likely to be an open area as the plan shows largely an open square, with ovens to the far west and one	In deliberate and direct association	unclear	None	n/a.	None detailed in files.	n/a
208	Room Fill-Locus 254-Excavated 9 May -The fill of the largest western room in the building at the south of H4/I4. -Measures 275 x 275cm -Consists of loam and clay fill with some mudbrick fragments. -Also plant remains-roofing material?	In deliberate and direct association	None	n/a	Within the same room as this object.	5	Within the room-locus 254 are 5 objects: 1 stone axe (no. 68), two clay figurine fragments (no. 64 7 67), 1 stone grinding slab (no. 69) and one misc. clay item (no. 65).
209	No deposition form. Excavated on 14th June Locus is located in the south centre of the square, a few cm east of a large oven [CQ] (measuring over 1.5m in radius).	In deliberate and direct	None	n/a	Within a 50cm radius.	1	Object no. 95 a "token".

	The western half and centre of the square has no features, many features (ovens, wall, pits) are found in other areas of the square.	association					
226	Oven Fill-Feature [G]-Excavated 11 May -Found with the fill of a tandoor (oven)-Feature "G". -The oven measures 0.75m x? (Runs into the baulk). _The oven has orange plaster lining, with many pebbles in the fill. -No other objects were found in	Items intentionally placed in direct association.	None	n/a. No finds in direct association.	In the fill of the oven.	None	n/a
272	Fill of Pit Feature [DY]-Locus 178. Excavated 1 May-19 June 2008 -Pit Feature [DY] Is a large ash pit measuring 375 x 200 cm and 0.65 cm deep. -It consists of mainly ash, and also charcoal and lime spots.	Items intentionally placed in direct association.	None	n/a. No finds in direct association.	Pit-fill of large pit Feature [EA] / Locus 178 (all lots within this).	3	Two additional geometric clay objects and one grinding stone is the total of all objects and artefacts found within the large volume of the pit fill (CO#s 272 & 275).
273	Locus 133-Soil layer-Excavated on 22 May -Characterised as greyish brown loam/clay consisting of charcoal, lime, mudbrick debris and ash pockets and burnt seeds -Covers an area of 4.5 x 2.5m -Contains many lots and objects -Wider Context-Square H	Items intentionally placed in direct association.	None	n/a. No finds in direct association.	Within the same open area between the buildings which dominate this square.	3	Object no. 126 is less than 50 to the west of this object. In the same open space, in the southern part (3m to the south) are object no's 122, a worked stone vessel/palette and 125, a stone vessel fragment.
325	-Found in a large, multiple burial-Pit "S"-named the "Death Pit"-which has an ashy fill. -The object was located near Burial 15 (body 15), but not necessarily related to it. -Burial pit feature [S] is located in the far north of the square.	Items intentionally placed in direct association.	None	n/a. No finds in direct association.	Within the "Death Pit" Feature [S] (locus 27), in the general fill and other burials.	6	A number of small fragments of what appear to be figurines. Listed on the electronic record are only 6 items: 2 misc. ceramics, 1 misc., 1 bone burin and two grinding slabs (no's 190, 243, 53, 92, 93).

Table A.F-7: Further detail of the context and associated artefacts found with the n=15 "anthropomorphic cone" shaped clay objects.

APPENDIX H: TIER 2 ANALYSIS-ADDITIONAL ILLUSTRATIONS

Below is a selection of illustrations from the analysis of the n=1,158 clay objects (and sealings) studied at tier 2 level. See Chapter 9 for full tier 2 study discussion. See individual object entries on the *Clay Object Database* (Appendix A) for all information including bibliographic references used in the recording of the tier 2 publication objects.

FIGURES

ALL TIER 2 SITES

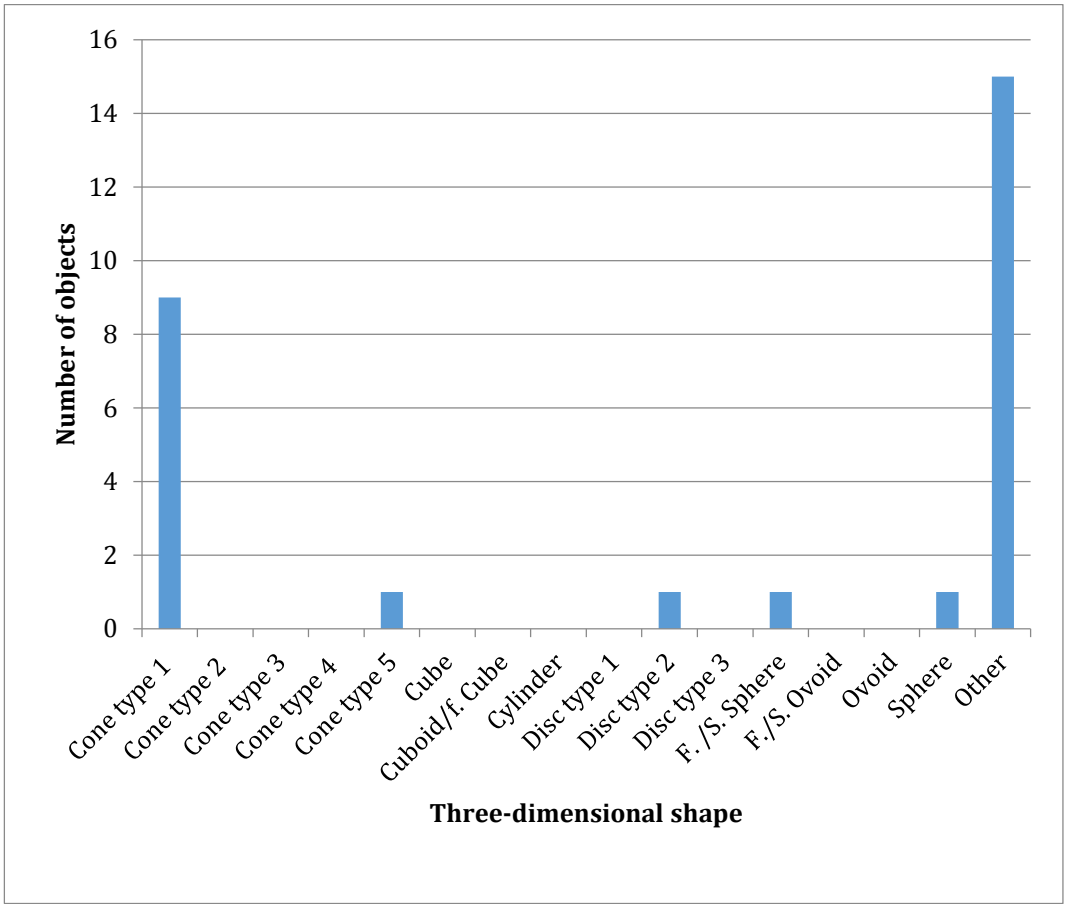


Figure A.H-1: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) of objects recorded at tier 2 Hajji Firuz Tepe. See individual object entries (Appendix A) under the site name for reference information.

[Appendix H]

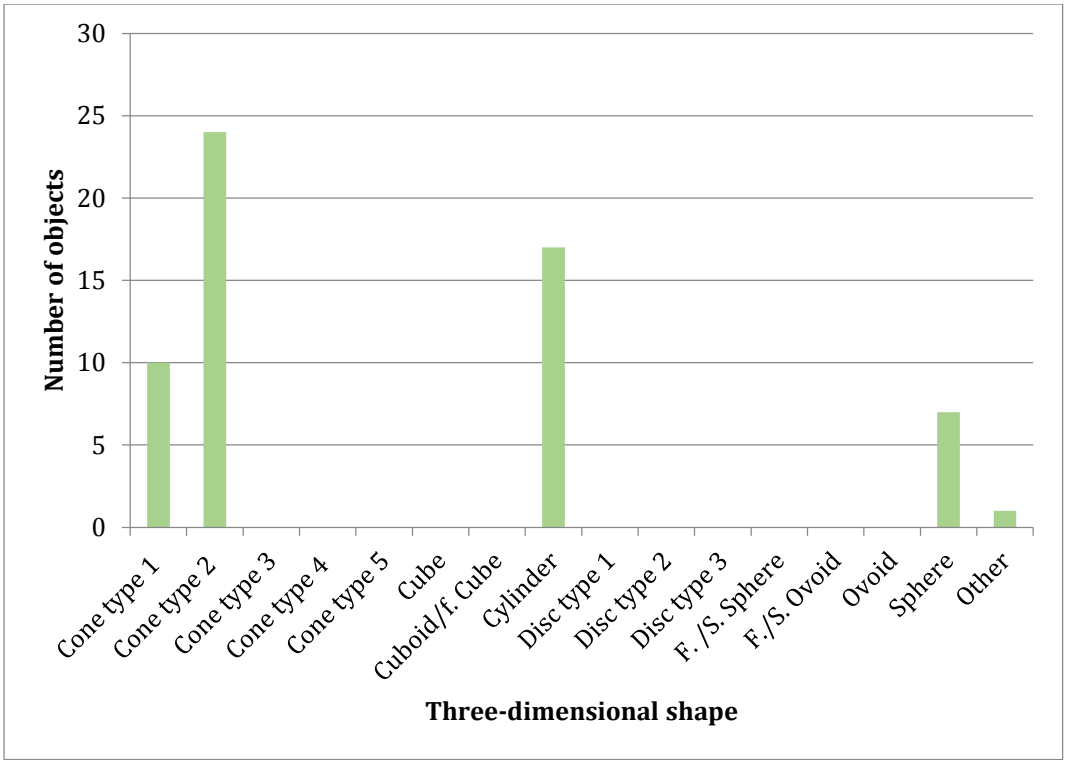


Figure A.H-2: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) of objects recorded at tier 2 Suberde. See individual object entries (Appendix A) under the site name for reference information.

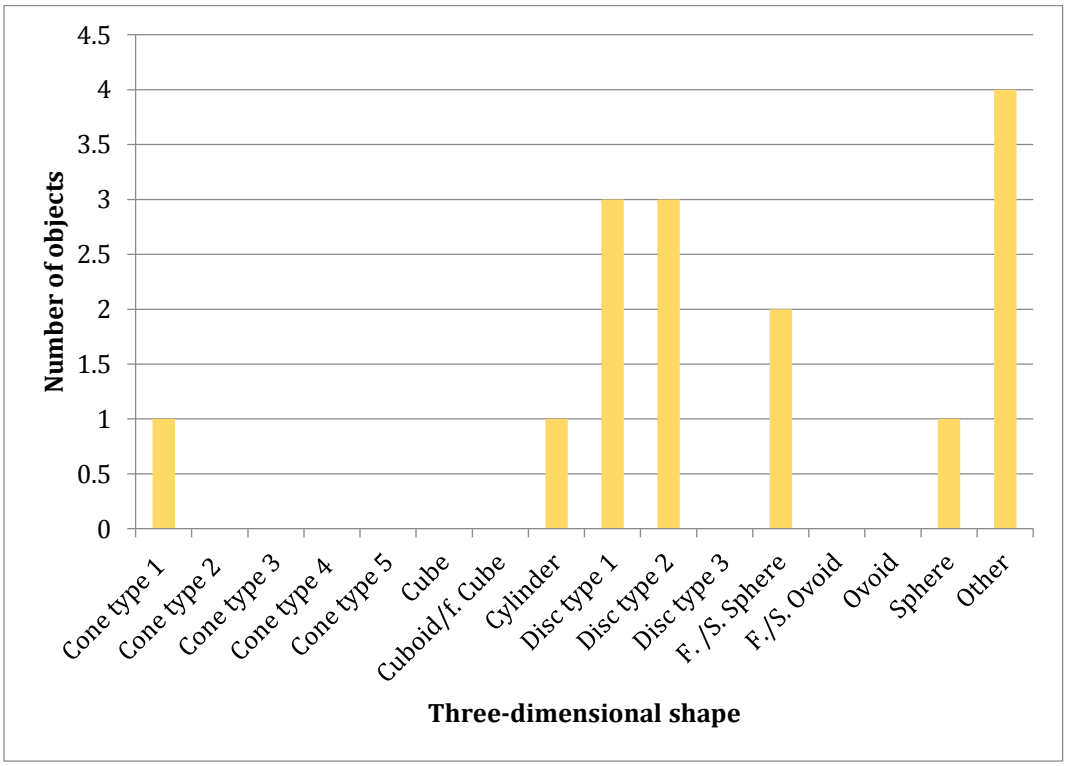


Figure A.H-3: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) objects recorded at tier 2 Salat Cami Yanı**.** See individual object entries (Appendix A) under the site name for reference information.

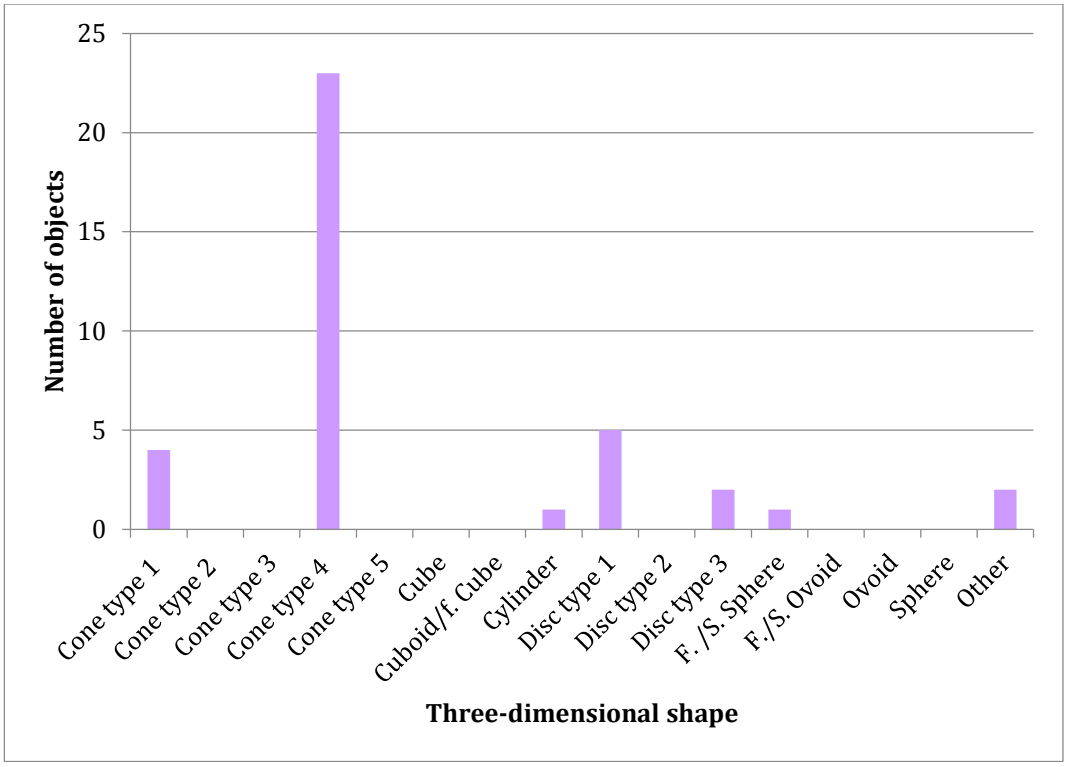


Figure A.H-4: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) of objects recorded at tier 2 Çayönü. See individual object entries (Appendix A) under the site name for reference information.

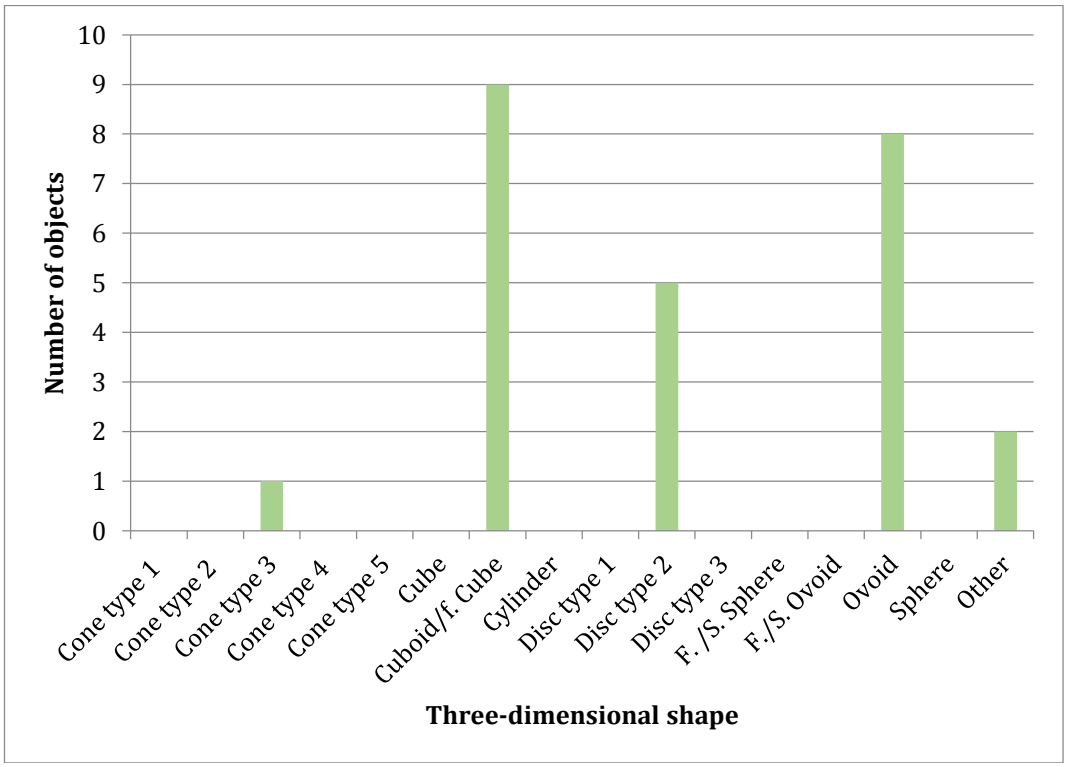


Figure A.H-5: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) of objects recorded at tier 2 Höyücek. See individual object entries (Appendix A) under the site name for reference information.

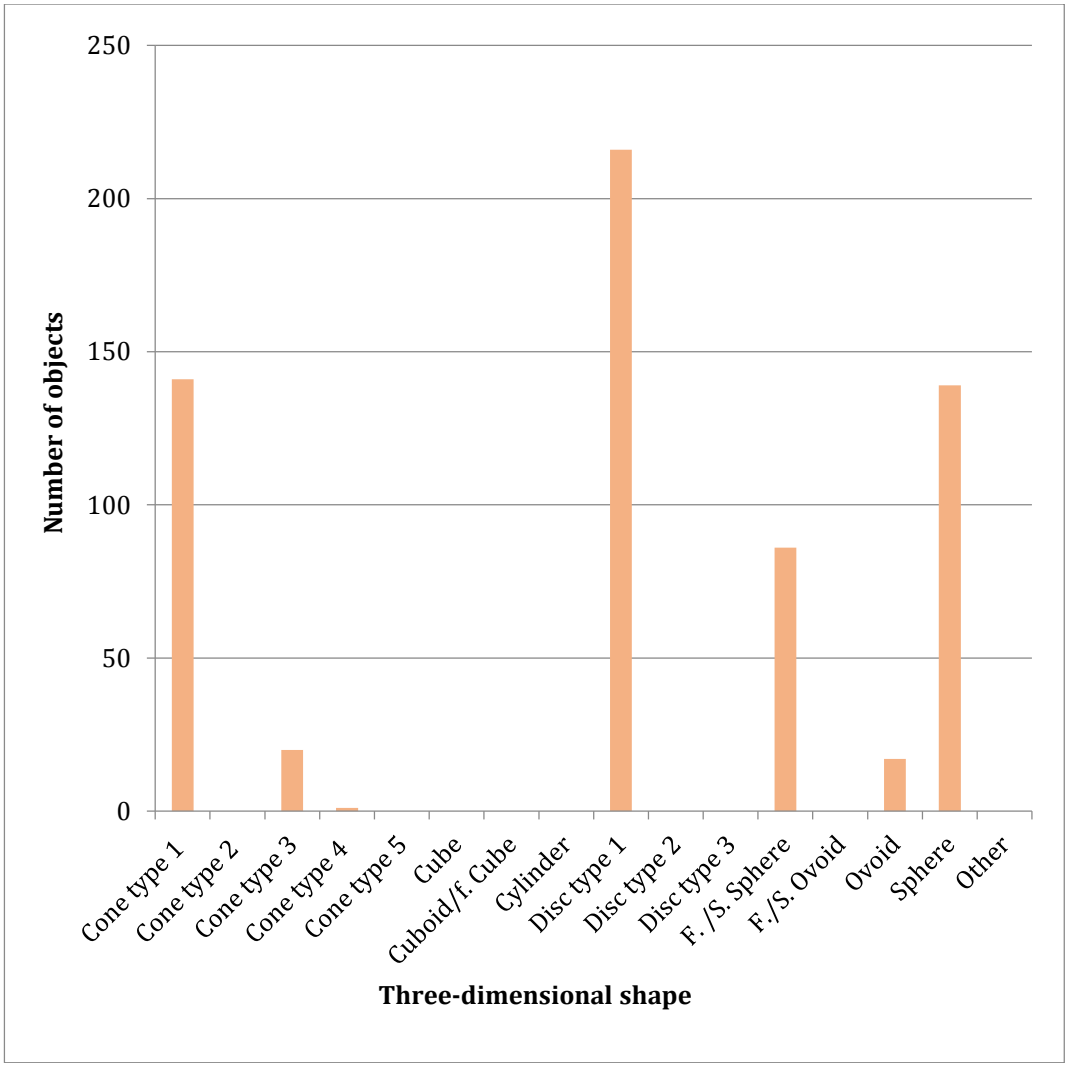


Figure A.H-6: Detail of the three-dimensional shape (as assigned on the *Clay Object Database*) of objects recorded at tier 2 Jarmo. See individual object entries (Appendix A) under the site name for reference information.

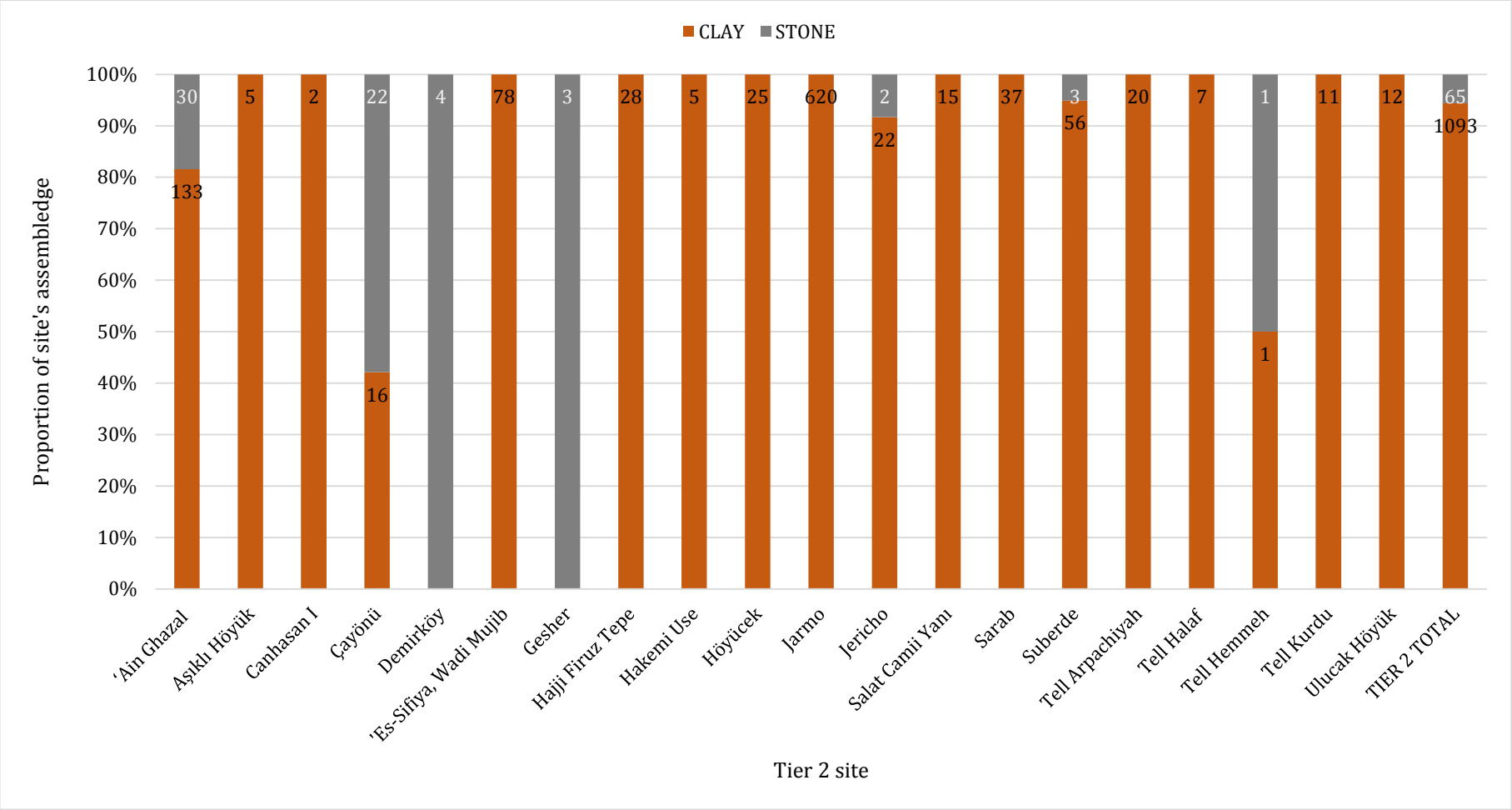


Figure A.H-7: Raw material (clay or stone); proportion of each site's assemblage, with total number of objects marked. See individual entries in Appendix A (*Clay Object -Database)* for references.

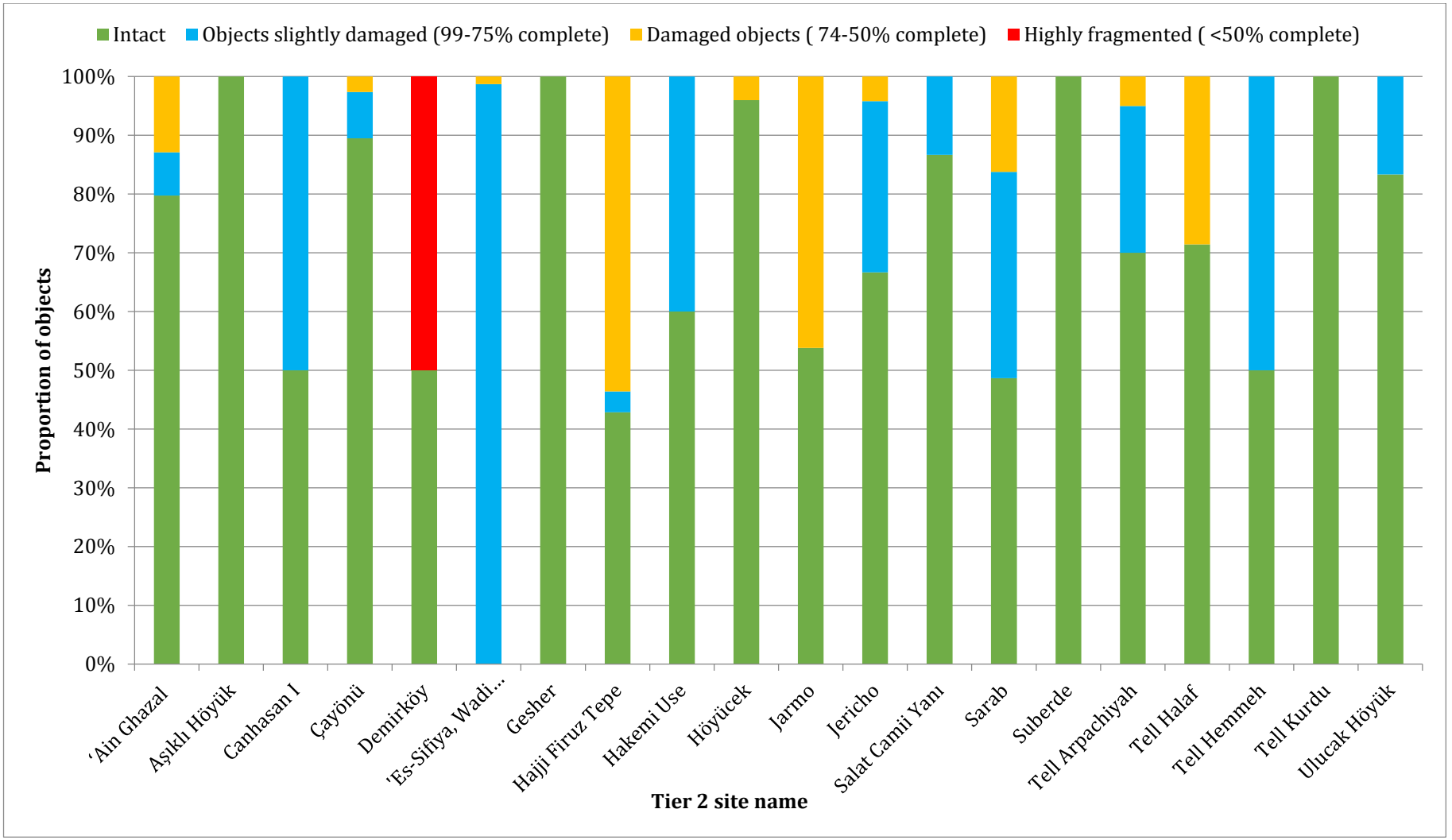


Figure: A.H-8: Comparison of the degree of fragmentation seen in tier 2 assemblages as grouped into four bins of "completeness". The percentage of each site's assemblage is detailed. See Appendix A: *Clay Object Database* for references and full details.

'AIN GHAZAL

Figure A.H-9: CO#1701-spherical shaped clay object. Well-rounded yet friable with a coarse finish. Possibly natural.

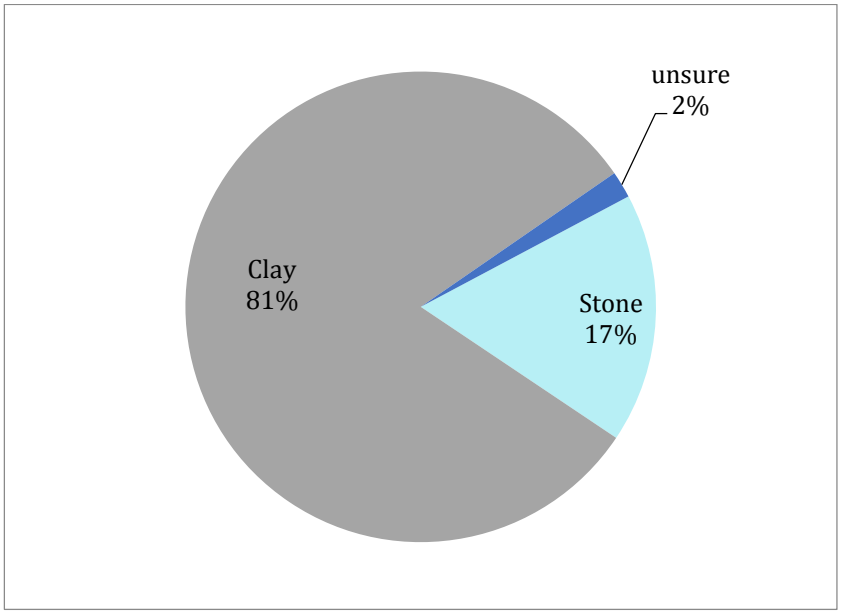


Figure A.H-10: Raw material of all studied objects from 'Ain Ghazal. (Includes data from Iceland: Chapter 1 and Appendix to Chapter 1).

[Appendix H]

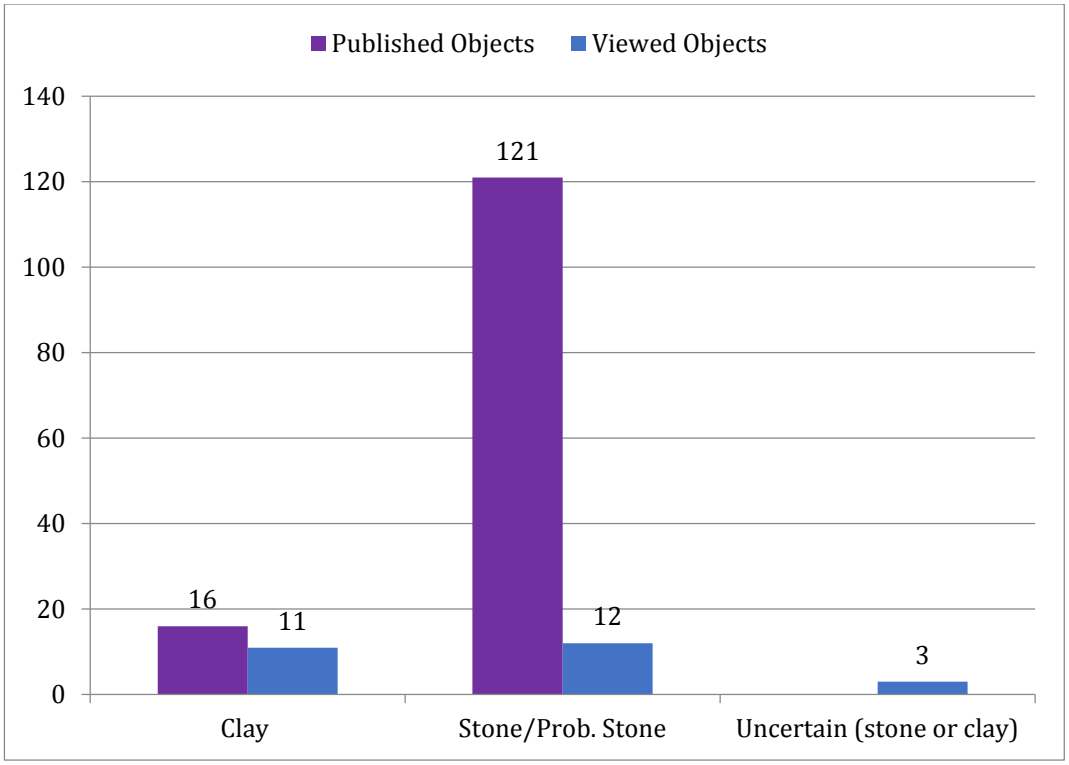


Figure A.H-11: Chart illustrating the number and proportion of objects of each basic raw material type- stone and clay. (Includes data from Iceland: Chapter 1 and Appendix to Chapter 1).

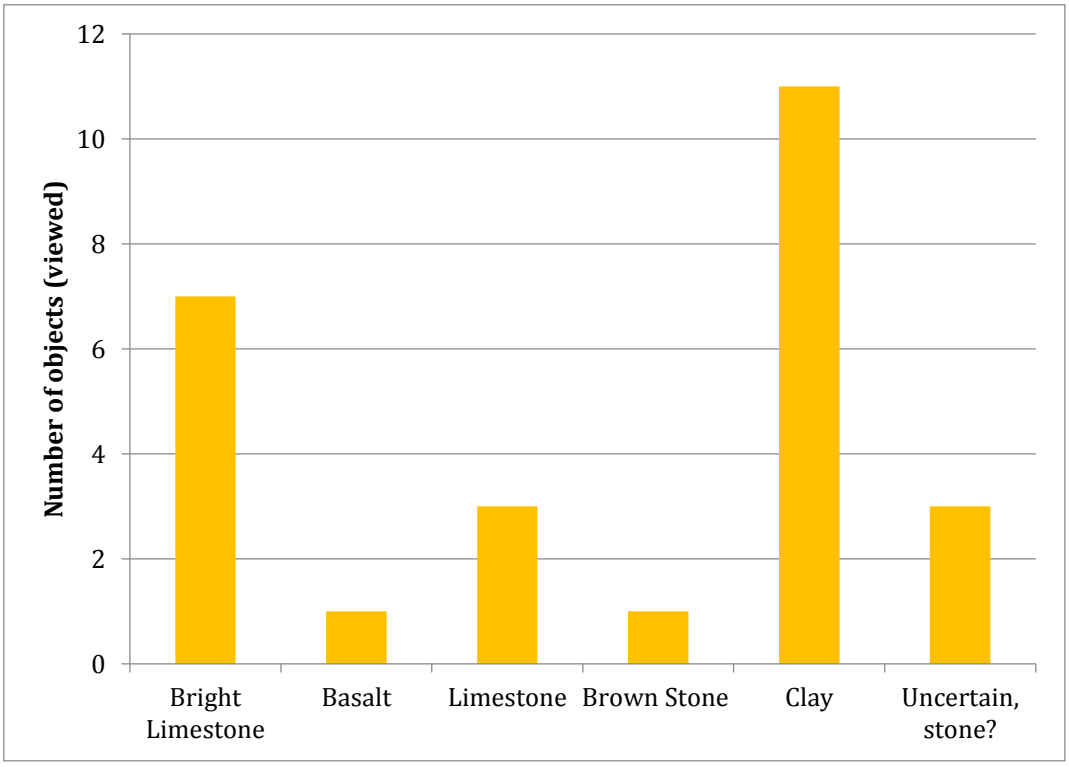


Figure A.H-12: Raw material and type of stone represented by the 26 viewed objects from 'Ain Ghazal.

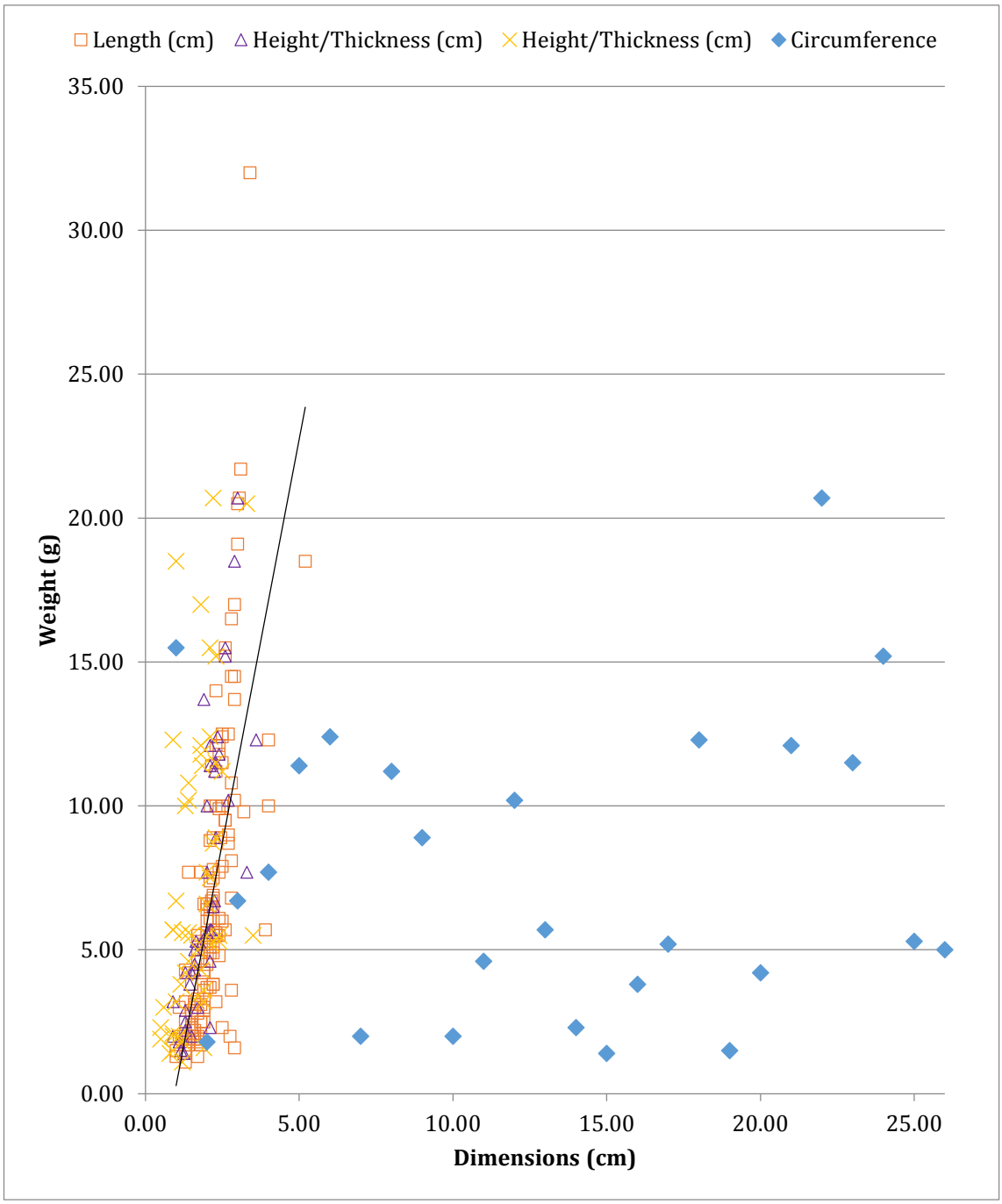


Figure A.H-13: Comparison of weight and size (length, width, height/thickness and circumference) of all studied clay objects from 'Ain Ghazal. (Includes data from Iceland: Chapter 1 and Appendix to Chapter 1).

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Figure A.H-14: CO# 1693. The object appears to be coated in another type of clay/pigment. The object is possible stone; the main body is beige/grey, however red pigment/coating on the outer surface remains. (Photograph: author's own).

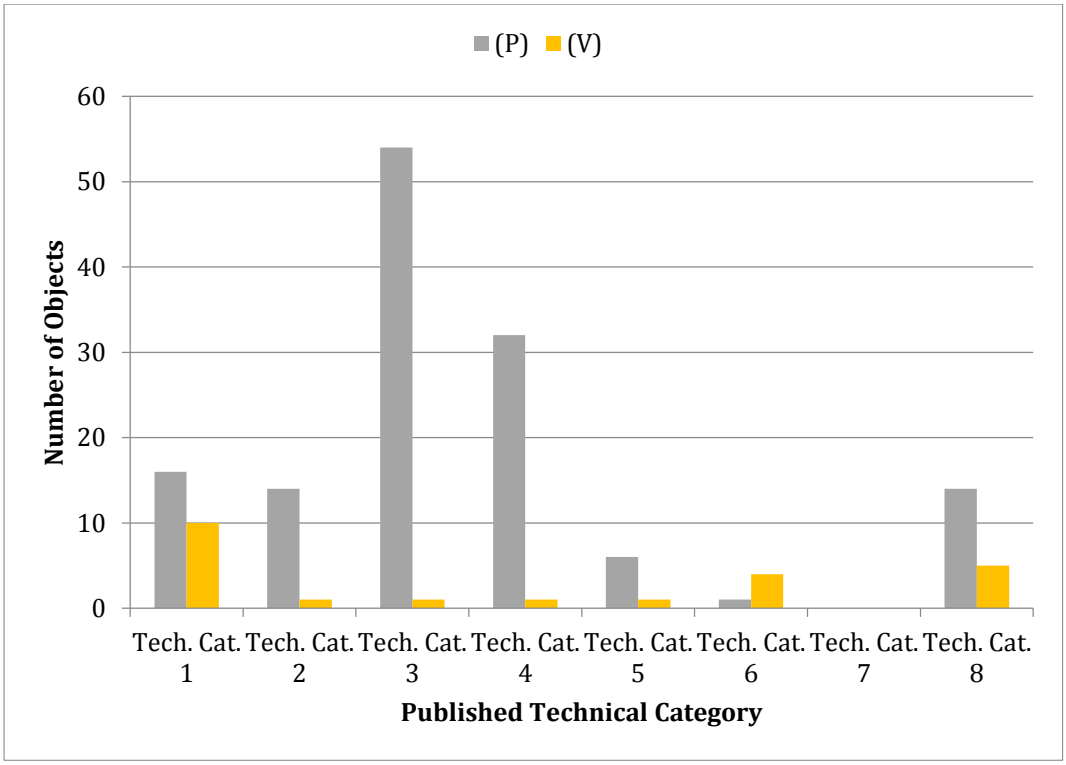

Figure A.H-15: Number of objects within each of Iceland's technical categories-published objects (P) and viewed objects (V) (assigned following the descriptions of each category (see Chapter 9 table 9.6 for category descriptions). (Data from Iceland: Chapter 1 and Appendix to Chapter 1).

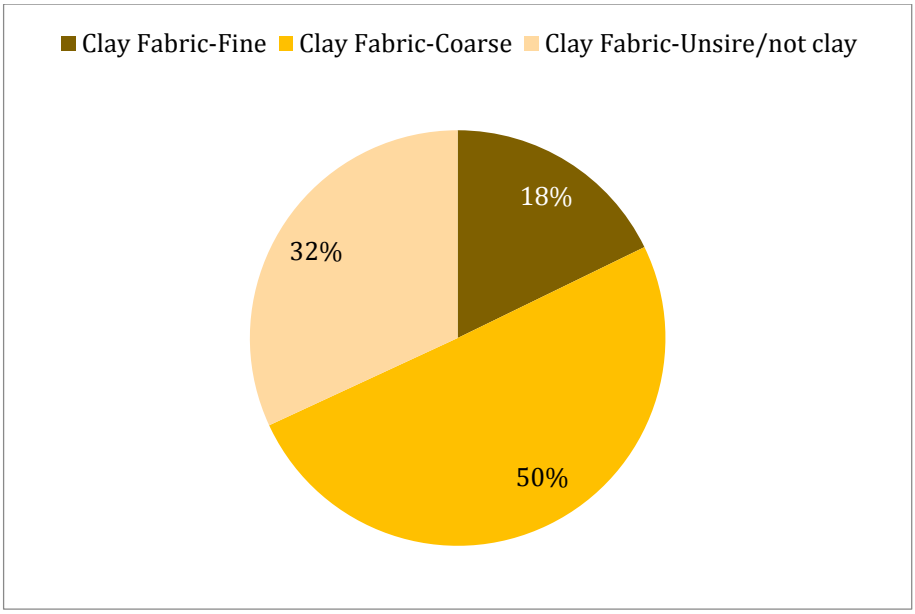

Figure A.H-16: Clay fabric as judged by the "technical category" assignment of all objects compared. (Data from Iceland: Chapter 1 and Appendix to Chapter 1).

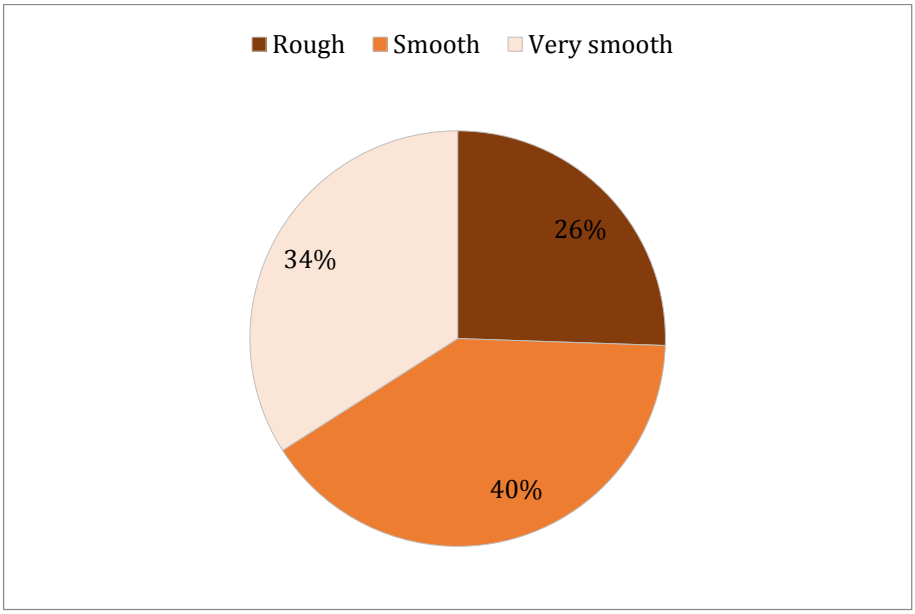

Figure A.H-17: Outer surface finish of all clay objects studied from 'Ain Ghazal. 71% (116) of studied objects do not have this information published. Therefore, the percentages above relate to the 47 (28.83%) objects that have this information recorded only. (Data from Iceland: Chapter 1 and Appendix to Chapter 1).

[Appendix H]

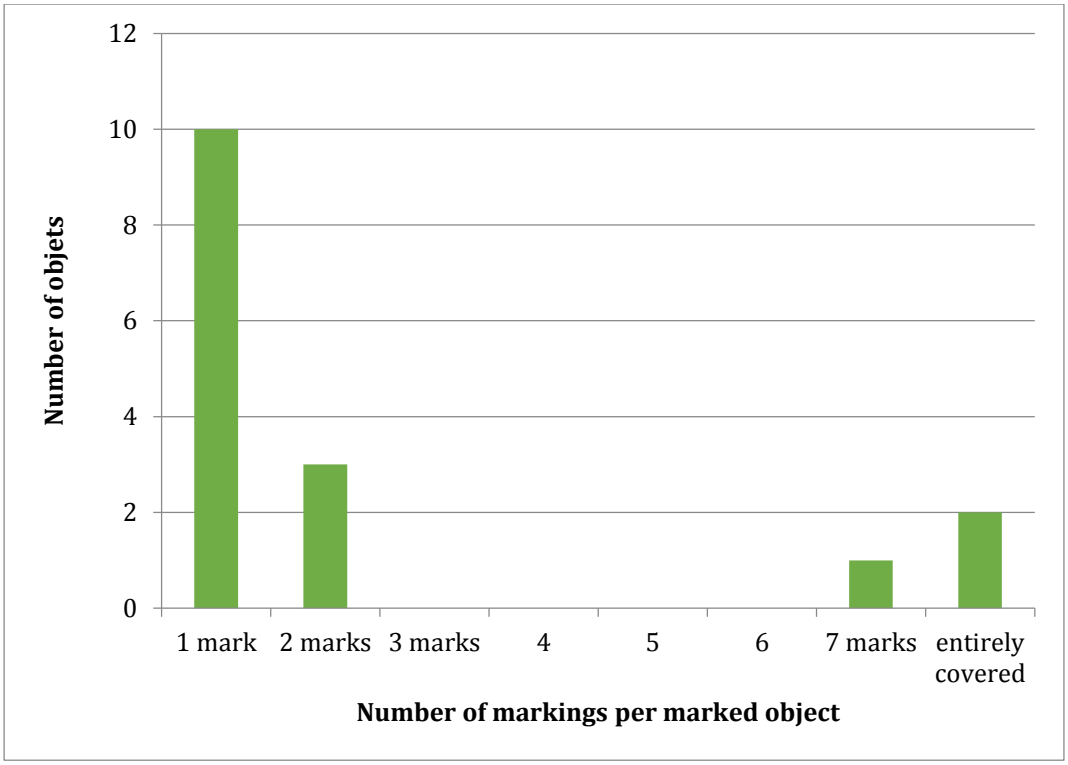

Figure A.H-18: Marked objects at 'Ain Ghazal: the number of intentional, decorative markings per marked object. (Includes data from Iceland: Chapter 1 and Appendix to Chapter 1).

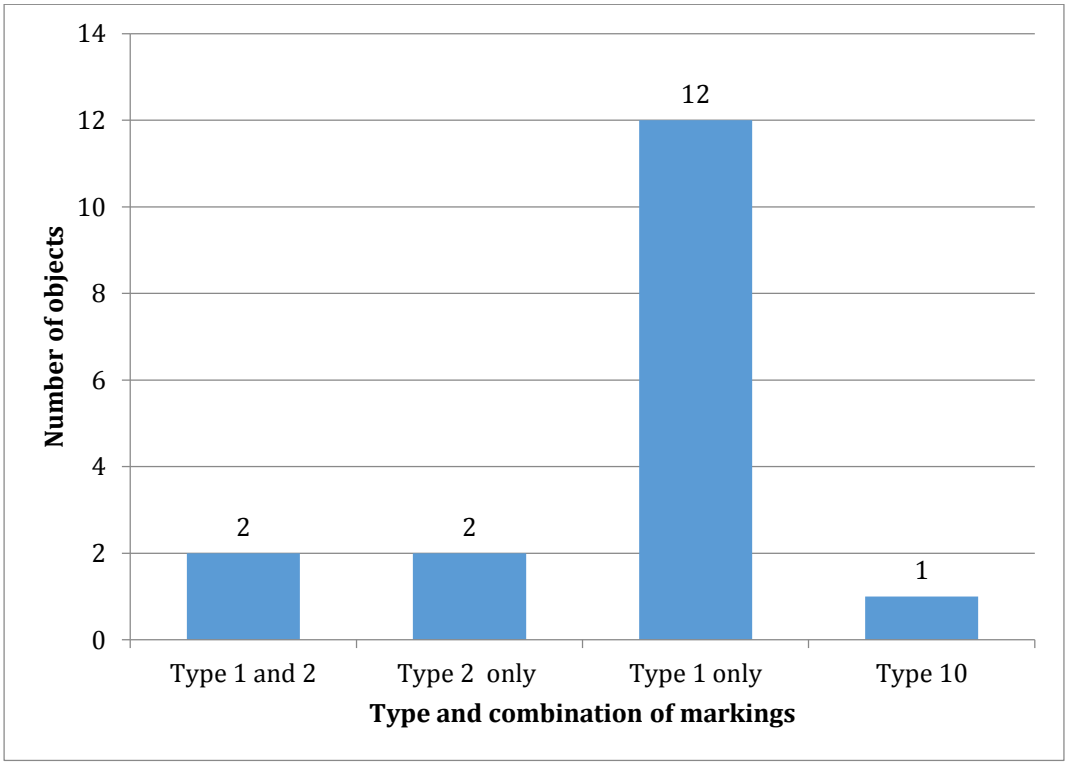

Figure A.H-19: Type and combination of markings per object at 'Ain Ghazal. (Includes data from Iceland: Chapter 1 and Appendix to Chapter 1).

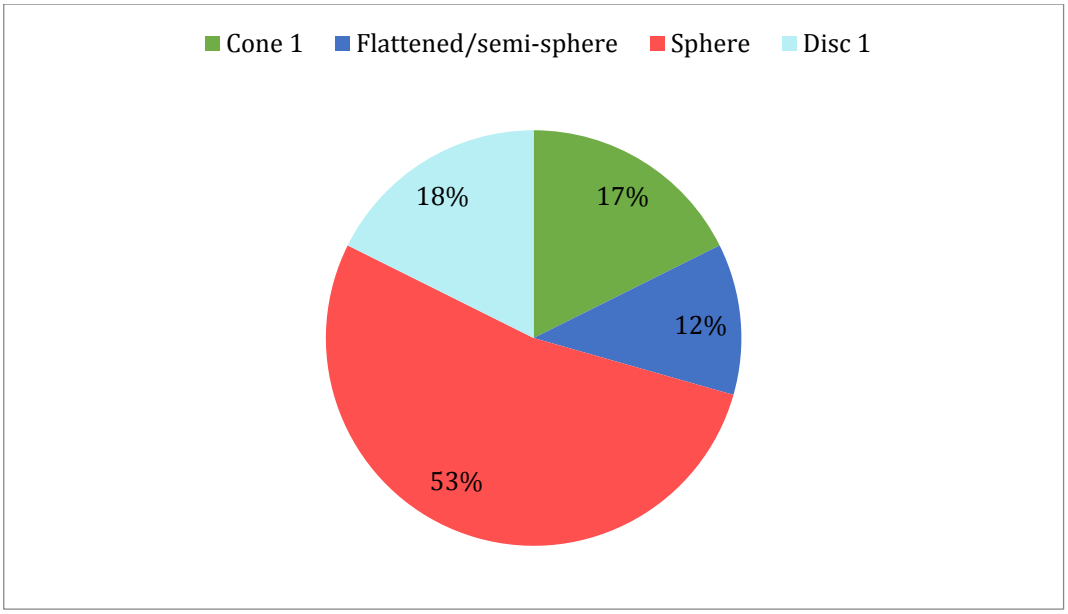

Figure A.H-20: Marked objects: at 'Ain Ghazal, by three-dimensional shape. (Includes data from Iceland: Chapter 1 and Appendix to Chapter 1).

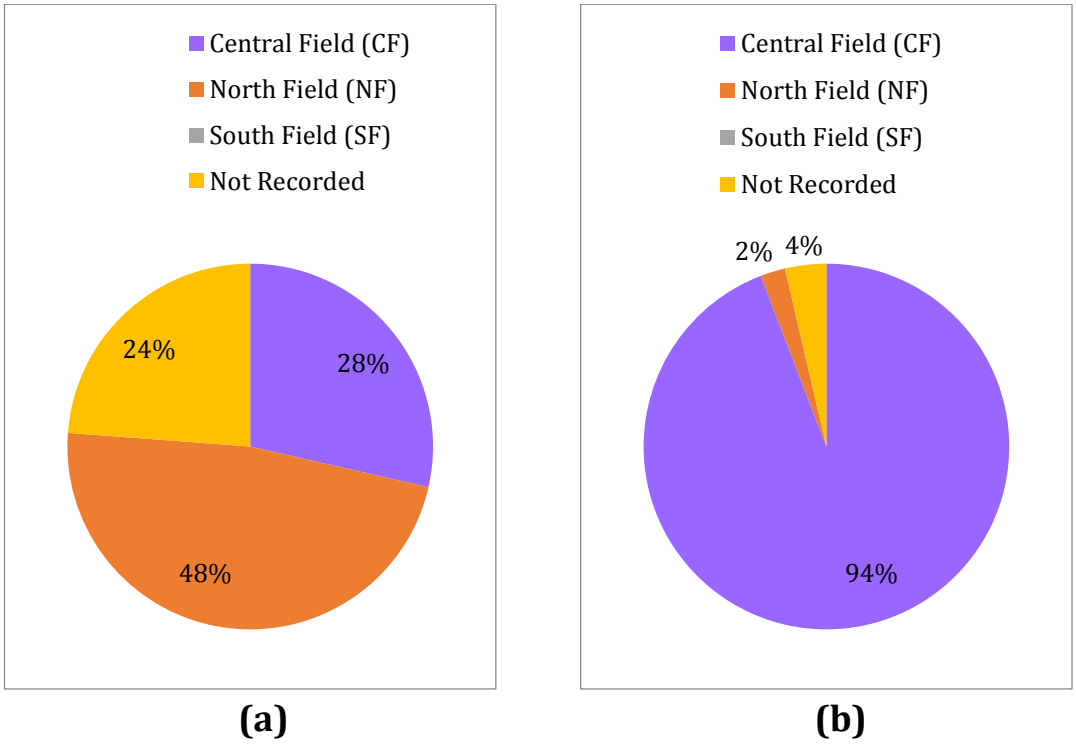

Figure A.H-21: Distribution of clay objects at 'Ain Ghazal across the different site areas. **(a)** Viewed objects (n=26), **(b)** published objects (n=137). (Includes data from Iceland: Chapter 1 and Appendix to Chapter 1).

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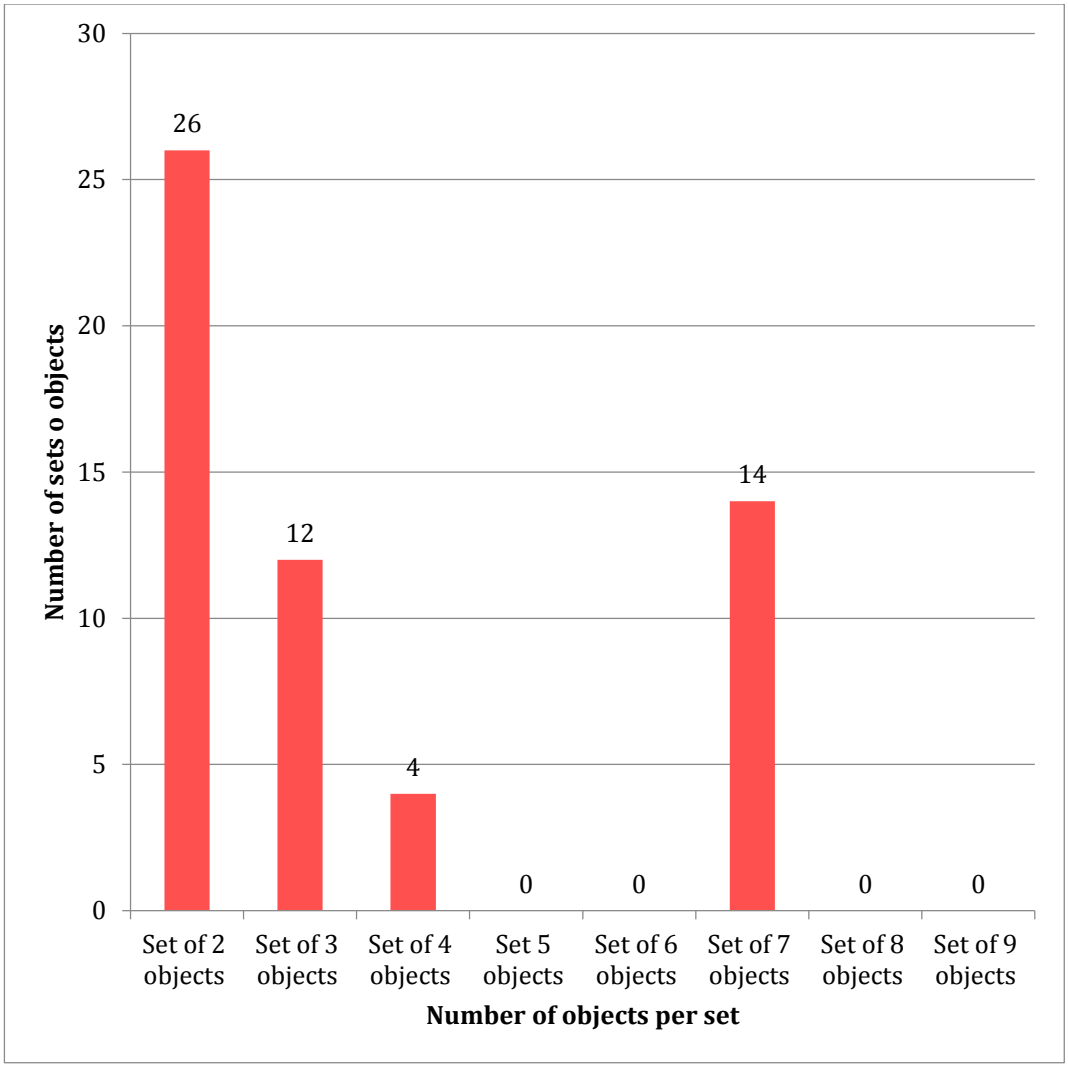


Figure A.H-22: Number of objects found with at least one other "token" in the same context (combination of matching *square, locus and bag/pail*) at 'Ain Ghazal. (Data from Iceland: Chapter 1).

ADDITIONAL TIER 2 SITES

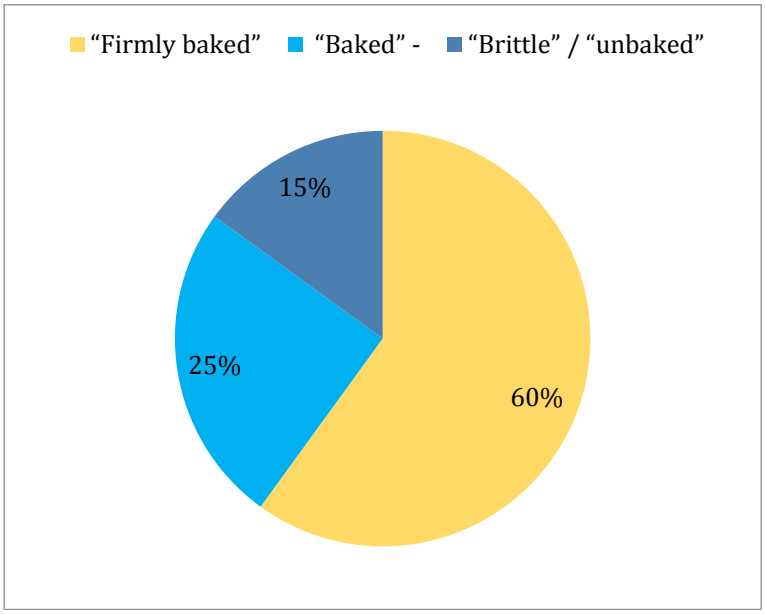


Figure A.H-23: Harding treatment of clay objects as recorded for the n=78 clay objects published from Late PPNB Es-Sifiya, Wadi Mujib (based on visual examination with a hand lens). Data gathered from textual discussion published in from Gebel & Mahasneh 1998: 108 and figure 1 p. 107).

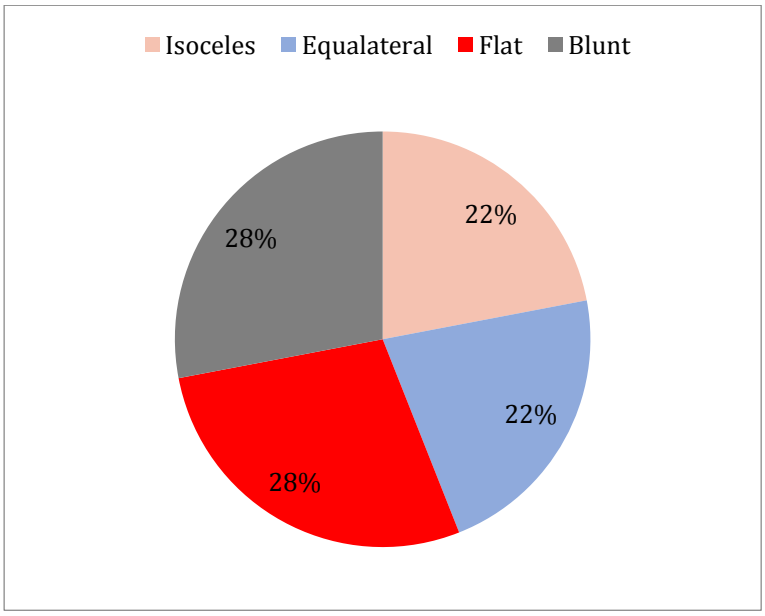


Figure A.H-24: Detail of the shape of the n=36 objects published as "cones" from LPPNB Es-Sifiya. Note the "flat" cones are recorded in the Clay Object Database as "semi-spheres". (Data gathered from textual discussion published in Mahasneh, Gebel 1998: 108 & fig. 1 p. 107).

[Appendix H]

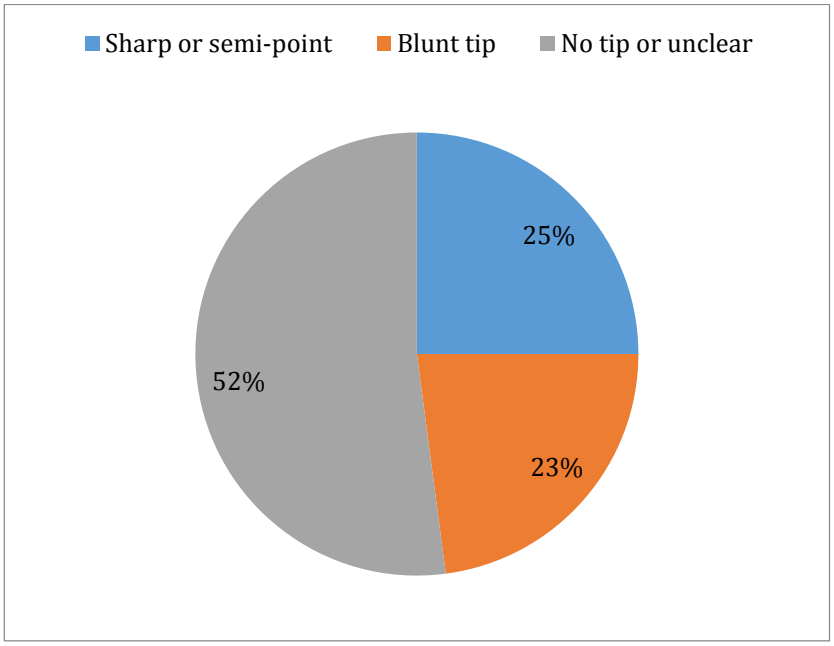


Figure A.H-25: Detail of the tip shape of the n=36 objects published as "cones" from LPPNB Es-Sifiya**.** Note the "flat" cones are recorded in the Clay Object Database as "semi-spheres". (Data gathered from textual discussion published in Mahasneh, Gebel 1998: 108 & fig. 1 p. 107).

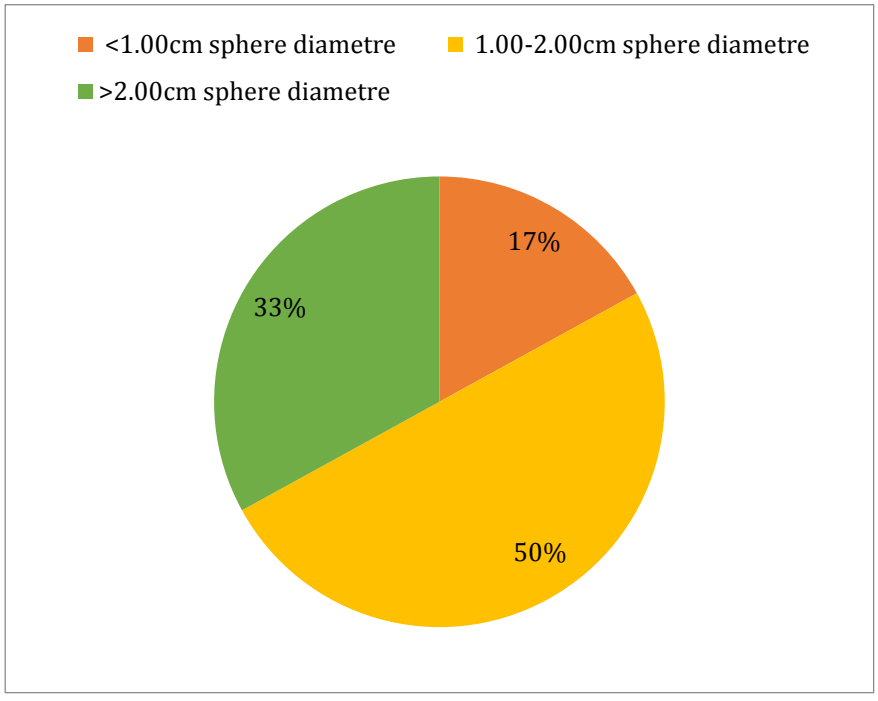


Figure A.H-26: Spheres at Wadi Mujib: diameter arranged in three size bins covering the full range found: 0.89-3.50cm. (Data from Mahasneh, Gebel 1998: 109).

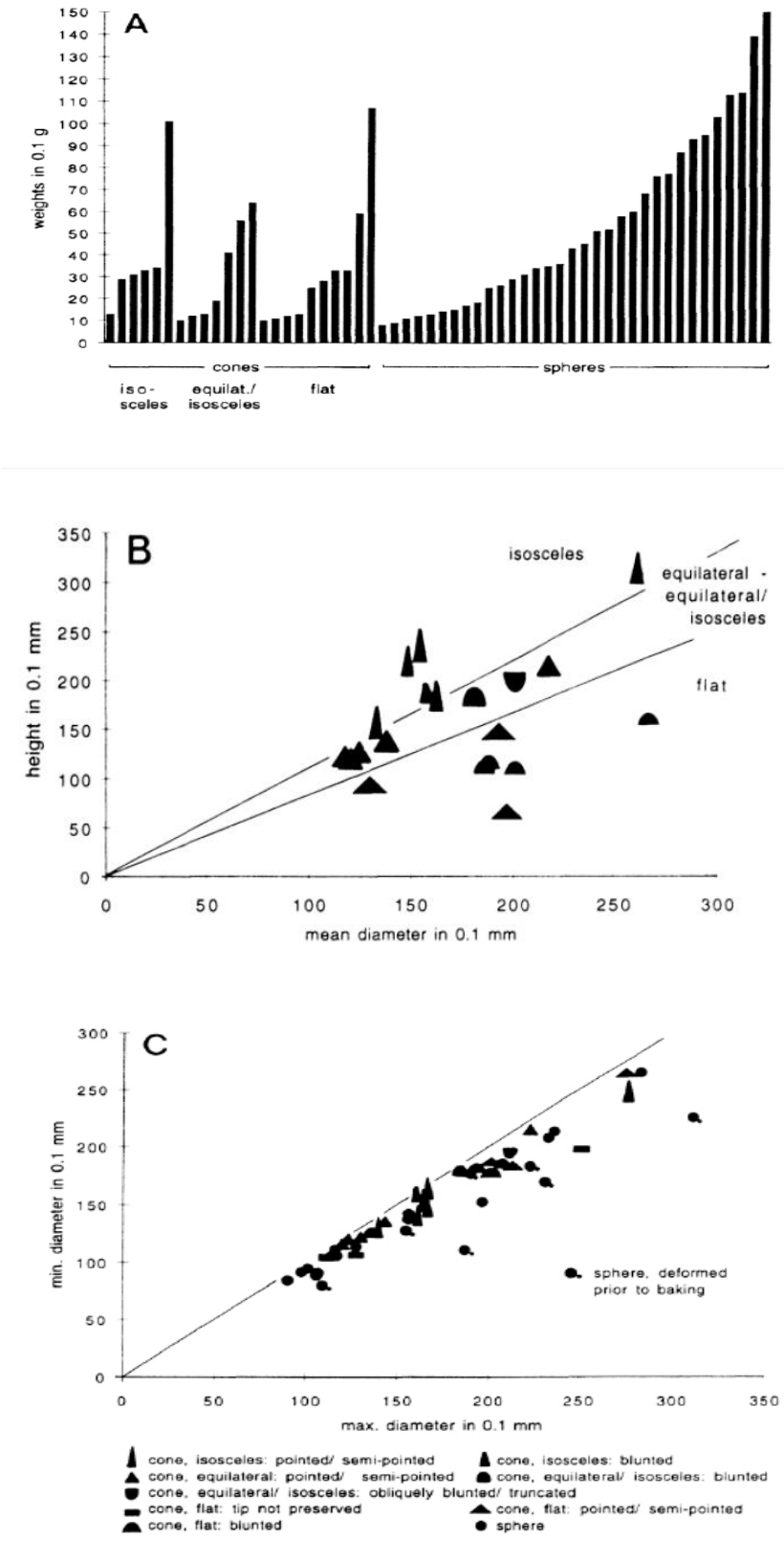


Figure A.H-27: Cone and sphere dimensions and weights at Es-Sifiya. **(A)** Weight range by three-dimensional shape, **(B)** Cone and semi-sphere height and diameter and **(C)** minimum and maximum diameter (roundness of base). (Data from Mahasneh & Gebel 1998: fig. 2 p. 109).

Figure A.H-28: Two small clay artefacts from 6th millennium cal. BC Hajji Firuz Tepe (Zagros region). Note the detailed of the markings; created by fingernail impressions (published as "figurines" and not recorded in the *Clay Object Database* as clay objects as their complete, original shape and size is unclear; especially the clearly fractured example. (Voigt 1983: fig. 101.d & g).

Figure A.H-29: Conical shaped clay object, with incised decoration on the base. Tell Halaf (upper Mesopotamia), c. 6th millennium cal. BC (base, side and top). Photographs: author's own.

Figure A.H-30: Structure 132 at Salat Cami Yanı (Ceramic Neolithic site on the Upper Tigris River, south east Anatolia). Detail of one of the site's wall paintings, from a plastered wall of a domestic structure can be seen as part of wider symbolic behaviour at the site. (University of Tsukuba 2010c: fig. 3).

[Appendix H]

TABLES

ALL TIER 2 SITES

DETAILED THREE-DIMENSIONAL SHAPE	NUMBER OF OBJECTS	PERCENTAGE OF TIER 2 OBJECTS
Sphere	290	25.04
Cone type 1	252	21.76
Disc type 1	244	21.07
F. /S. Sphere	118	10.19
Other	40	3.45
Ovoid	38	3.28
Cylinder	34	2.94
Cone type 4	32	2.76
Cone type 2	27	2.33
Cone type 3	26	2.25
Disc type 2	22	1.90
Cuboid/f. Cube	14	1.21
Cone type 5	13	1.12
F./S. Ovoid	6	0.52
Disc type 3	2	0.17
Cube	0	0.00
TOTAL	**1,158**	**100.00**

Table A.H-1: Detail of the three-dimensional shape (as assigned during analysis, not necessarily as published) of all tier 2 objects combined. See individual entries in Appendix A (*Clay Object - Database*) for references.

DETAILED THREE-DIMENSIONAL SHAPE	AIN GHAZAL	AŞIKLI HÖYÜK	CANHASAN I	ÇAYÖNÜ	DEMIRKÖY	'ES-SIFIYA, WADI MUJIB	GESHER	HAJJI FIRUZ TEPE	HAKEMI USE	HÖYÜCEK	JARMO	JERICHO	SALAT Cami YANI	SARAB	SUBERDE	TELL ARPACHIYAH	TELL HALAF	TELL HEMMEH	TELL KURDU	ULUCAK HÖYÜK
Cone type 1	22	5	0	4	0	25	0	9	2	0	141	4	1	7	10	7	2	0	4	9
Cone type 2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	24	0	1	0	0	0
Cone type 3	0	0	0	0	0	0	0	0	0	1	20	1	0	4	0	0	0	0	0	0
Cone type 4	2	0	0	23	0	1	0	0	0	0	1	0	0	4	0	0	1	0	0	0
Cone type 5	0	0	0	0	0	0	0	1	1	0	0	0	0	10	0	0	1	0	0	0
Cube	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cuboid/f. Cube	0	0	0	0	0	0	0	0	0	9	0	3	0	0	0	2	0	0	0	0
Cylinder	2	0	0	1	1	1	0	0	0	0	0	5	1	4	17	2	0	0	0	0
Disc type 1	11	0	1	5	1	0	0	0	0	0	216	2	3	1	0	1	0	0	0	3
Disc type 2	3	0	0	0	0	1	0	1	0	5	0	1	3	3	0	1	0	0	4	0
Disc type 3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F. /S. Sphere	16	0	0	1	0	10	1	1	0	0	86	0	2	0	0	0	0	1	0	0
F./S. Ovoid	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0
Ovoid	4	0	1	0	0	0	1	0	0	8	17	1	0	0	0	3	0	0	3	0
Sphere	98	0	0	0	0	36	0	1	0	0	139	4	1	3	7	0	0	1	0	0
Other	1	0	0	2	2	4	0	15	2	2	0	3	4	0	1	2	2	0	0	0
TOTAL	**163**	**5**	**2**	**38**	**4**	**78**	**3**	**28**	**5**	**25**	**620**	**24**	**15**	**37**	**59**	**20**	**7**	**2**	**11**	**12**

Table A.H-2: Detail of the three-dimensional shape (as assigned during analysis, not necessarily as published) of all tier 2 objects according to site. See individual entries in Appendix A (*Clay Object Database*) for references.

SITE NAME	PERCENTAGE OF SITE'S ASSEMBLAGE 100% COMPLETE	PERCENTAGE OF SITE'S ASSEMBLAGE 99-75% COMPLETE	PERCENTAGE OF SITE'S ASSEMBLAGE 74-50% COMPLETE	PERCENTAGE OF SITE'S ASSEMBLAGE <50% COMPLETE
'Ain Ghazal	79.75	7.36	12.88	0.00
Aşıklı Höyük	100.00	0.00	0.00	0.00
Canhasan I	50.00	50.00	0.00	0.00
Çayönü	89.47	7.89	2.63	0.00
Demirköy	25.00	0.00	0.00	25.00
'Es-Sifiya, Wadi Mujib	0.00	98.72	1.28	0.00
Gesher	100.00	0.00	0.00	0.00
Hajji Firuz Tepe	42.86	3.57	53.57	0.00
Hakemi Use	60.00	40.00	0.00	0.00
Höyücek	96.00	0.00	4.00	0.00
Jarmo	38.71	0.00	33.23	0.00
Jericho	66.67	29.17	4.17	0.00
Salat Cami Yanı	86.67	13.33	0.00	0.00
Sarab	48.65	35.14	16.22	0.00
Suberde	100.00	0.00	0.00	0.00
Tell Arpachiyah	70.00	25.00	5.00	0.00
Tell Halaf	71.43	0.00	28.57	0.00
Tell Hemmeh	50.00	50.00	0.00	0.00
Tell Kurdu	100.00	0.00	0.00	0.00
Ulucak Höyük	83.33	16.67	0.00	0.00

Table A.H-3: Details of the proportion of objects from each tier 2 site's assemblage which are complete and fragmented-by degree of damage. (This data was available for n=982 tier 2 objects (84.80%), and for 100% of each site's assemblage aside from Demirköy (data available for 50% of the sites recorded objects) and Jarmo (data available for 71.94% of the site's recorded assemblage). See Appendix A: *Clay Object Database* for references by site, and more details.

'AIN GHAZAL

(a)

DEGREE OF COMPLETENESS	NUMBER OF OBJECTS	PERCENTAGE
100% Complete	130	79.75
75-99% Complete	12	7.36
50-74% complete	21	12.88
25-49% Complete	0	0.00
<25% Complete	0	0.00

(b)

WIDTH OF CLAY OBJECT	0. 5 - 0. 9 cm	1. 0 - 1. 9 cm	2.0 - 2.9 cm	3. 0 - 3. 9 cm	4. 0 – 4. 9 cm	≥ 5 cm
NUMBER OF RECORDED EXAMPLES	1	55	70	8	1	1

Table A.H-4: (a) Fragmentation/degree of completeness of all objects-viewed and published from 'Ain Ghazal. (Includes data from Iceland: Chapter 1 and Appendix to Chapter 1). **(b)** Dimensions (width) of the clay objects recorded by Iceland, from Neolithic 'Ain Ghazal. The overwhelming majority are within the 1cm to 2.9 cm range; small enough to fit inside the depressions of the gaming board found at the site, as well as the eleven other Neolithic examples detailed by Simpson 2007. (Iceland 2010a).

[Appendix H]

ADDITIONAL SITES

CHARACTERISTIC	DETAIL
Clay texture	**Spheres and cones are made from different textured clays:** **Cones:** -*Mostly* crafted from fine grained clay types **Spheres:** -*Most* are made from porous clays: **Spheres are either:** -Fine grained -Sandy inclusions -Solid texture -45% of objects Or -Less dense/porous texture clay -Mineral inclusion >1mm -53%
Inclusions	- Present yet interpreted as non-intentional (not temper). -No cultural inclusions found (shell, bone, wood etc.)
Outer surface finish	-57% "smoothed" or "well smoothed"
Fingerprints	-Common -32% of objects
Coating	-"Some" have a "thin" slip
Clay colour	Wide ranging, from black to white and all colours in between. Colour varies on single objects due to uneven heat treatment. Mostly "blackish"
Harding treatment	-"Most" intentionally hardened: -baked, fired or "exposed to some heat" 60%- "Firmly baked" 25%- "Baked" 15%- "Brittle" / "unbaked" -Heat distribution uneven in most cases -Some clay objects were <u>not</u> hardened: -white in colour -not fired -friable
Fragmentation	82% complete or "near" complete

Table A.H-5: Summary of the technical characteristics of the small geometric clay objects recorded from Late PPNB Es-Sifiya, Wadi Mujib (based on visual examination with a hand lens). (Data gathered from textual discussion published in Mahasneh & Gebel 1998: 108 & fig. 1 p. 107).

SPHERE ROLLING ABILITY	PERCENTAGE OF SITE'S SPHERES
"Rolls well" (perfectly spherical)	**47%**
"Rolls imperfectly" (roughly spherical)	**36%**
"Rolls barely/not at all" (objects with a semi-spherical or oval section)	**17%**

Table A.H-6: Spheres at Es-Sifiya: results of the "perfection test" carried out on all spheres to see how well they roll. (Data from Mahasneh & Gebel 1998: 109).

[Appendix H]

NUMBER	PUBLISHED AS	DESCRIPTION	REFERENCE
n=1 (CO# 1690)	"Incised reddish limestone object"	-Rounded -Measures 2.50cm tall, 1.9cm diameter -Oblique base: flat, well defined and with some scratches (parallel) in the centre. **Decoration:** -The top part is rounded (semi spherical) and the entire rounded top part is encircled by a groove: 2mm wide, 1.5mm deep -There is another, thinner line parallel to the engraving on the object	(Garfinkel & Dag 2006: p.157, figs. 6.1:5, figs. 6.6 & 6.7 p. 158, pl. XIIa.
n=2 (CO#S16 91-92)	"Miniature grooved items... function is unclear""	**Groove** -Seen on both objects -shallow -Interpreted as possible beads if this groove was used to tie them to something -Quite likely merely decorative grooves -Or used to tie them onto clothing, basketry etc. -The groove does extend around the entire circumference of the first object **Item 1:** -Rounded/Oval -Basalt -Encircled by a "shallow groove " -Groove: 9mm x 5mm, less than 1mm deep **Item 2:** -Described as "minute" -Burnished -Probably made from clay-uncertain -Dark coloured -One side have an incised groove in the middle along the longitudinal axis -Groove measures 7mm x 3.5mm x 2mm.	(Garfinkel & Dag 2006: p. 157, fig. 6.1:3-4.

Table A.H-7: Detail of the published small geometric objects from PPNA Gesher (CO#s 1,690-1,692). (Garfinkel & Dag 2006: 153-57, 175).

CATEGORY AS PUBLISHED- CHAPTER	SUB-CATEGORY	TOTAL NUMBER OF OBJECTS REFERRED TO IN PUBLICATION (as a % of total referred to, n=441)	NUMBER ILLUSTRATED (BROMAN MORALES 1983)	NUMBER RECORDED ONTO THE CLAY OBJECT DATABASE/ APPENDIX A (as a % of recorded total)	DESCRIPTION	EXCAVATOR'S INTERPRETATION
***"ABSTRACT AND GEOMETRIC FORMS" - "Abstract Forms"* chapter**	-	**107**	**24**	**12**	Varied. See published illustrations.	See discussion in "Geometric Forms" chapter"
	"Abstract double-winged base objects"	69 (15.65 %)	13	13 (35.14 %)	As above.	See discussion in "Geometric Forms" chapter"
	"Miscellaneous - shaped object"	1 (0.23 %)	1	1 (2.70 %)	Varied. See published illustrations.	See discussion in "Geometric Forms" chapter"
	"Stalk objects with **nail heads"**	38 (8.62 %)	11	11 (29.73 %)	Varied. See published illustrations.	See discussion in "Geometric Forms" chapter"
***"GEOMETRIC AND PERFORATED FORMS" "Geometric Forms"* chapter**	-	**334**	**24**	**24**	-Diverse category including: -balls -flattened discs -cone -tetrahedrons	-blocks -oblongs -rod fragments -rolled pieces
	"Small balls"	79 (17.91 %)	3 (	3 (8.11 %)	-Balls are the most common category within "geometric forms" -Many are incised	-Used as counters, by shepherds -Used to count sheep -Perhaps also used as marbles (again by the shepherds) whilst tending to their flocks -The incisions present on some are interpreted as changing the unit value of the piece.

	"Flattened discs"	123 (27.89 %)	4	4 (10.81 %)	-Often have straw inclusions -Many show straw impressions on the base -Impressions on the base interpreted as a lack of care taken in the crafting of flattened discs	-Counters also (for shepherds to use in counting their sheep) -An alternative shape for the shepherds to use instead of (not alongside) the "small balls" -Also may have been used as gaming pieces (by whom, and why not explained). -Possible "doodles in clay" also proposed for the discs-due to the supposed lack of care in their craft (presence of straw impressions on the base)
	"Cones"	76 (17.23 %)	9	9 (24.32 %)	-Both tall and stand upright	-Served as either counters or gaming pieces -Due to their shape: enabling upright standing
	"Tetrahedrons"	4 (0.91 %)	4	4 (10.81 %)	As "cones" above.	As "cones" above.
	"Blocks and oblongs"	15 (3.40 %)	4	4 (10.81 %)	-Well formed, attention to detail in craft -Most are decorated	-Served as either counters or gaming pieces (no justification)
TOTAL	**-**	**441**	**49**	**37**	**-**	**-**

Table A.H-8: Detail of the different types of descriptive categories the small geometric clay objects from Sarab were divided into for publication, along with the excavator's interpretation of their use. A total of 2,400 shaped clay pieces were recovered from the site in a single excavation season in 1960 (Broman Morales 1990: 1, 22).

NUMBER	SHAPES	MATERIAL	PERIOD/PHASE	INTERPRETATION
12	Disc, cones, spheres: simple geometrics	Baked clay	Various phases of the Late Neolithic period	"It is likely they served as counting devices representing quantities of goods exchanged."

Table A.H-9: Summary of the cone shaped clay objects recovered from Late Neolithic Ulucak Höyük, Western Anatolia. (Data from Çilingiroğlu *et al.* 2004: 48-9, fig 31.6-17 p. 125).

APPENDIX I: CASE STUDY SITE ANALYSIS

Below are additional illustrations from cross case-study site (tier 1) analysis of Boncuklu Höyük, Çatalhöyük and Tell Sabi Abyad. See Chapters 6, 7 and 8 for full, site-by-site analysis. See Chapter 10 for comparative analysis and discussion.

FIGURES

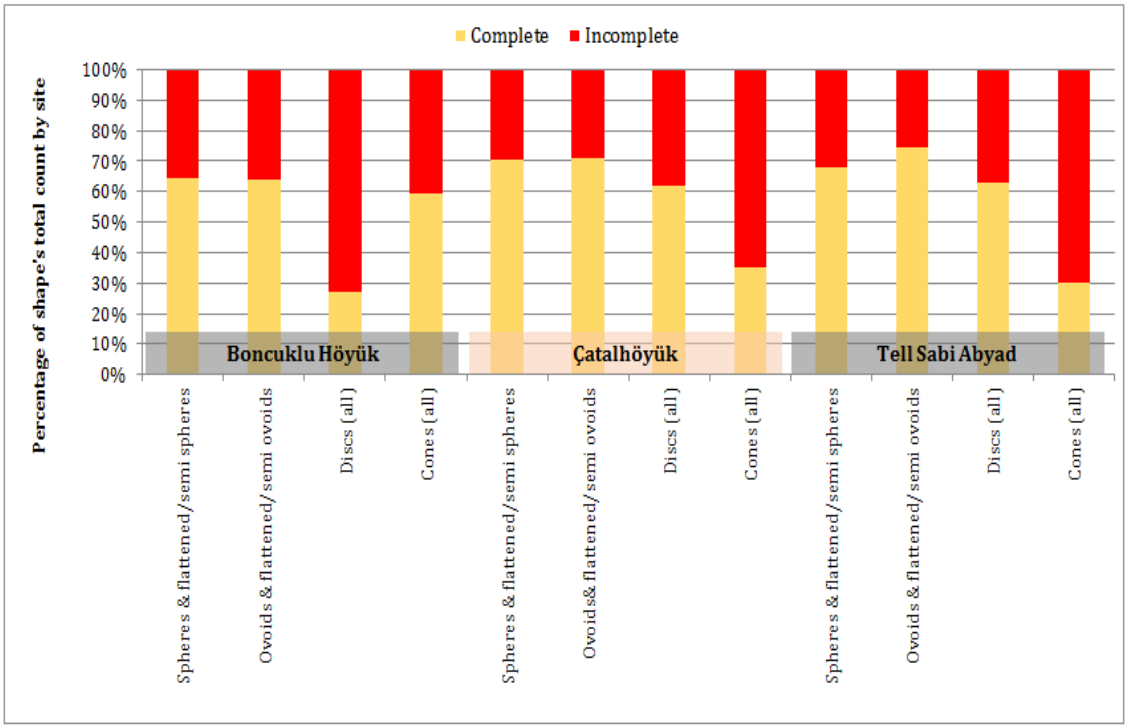
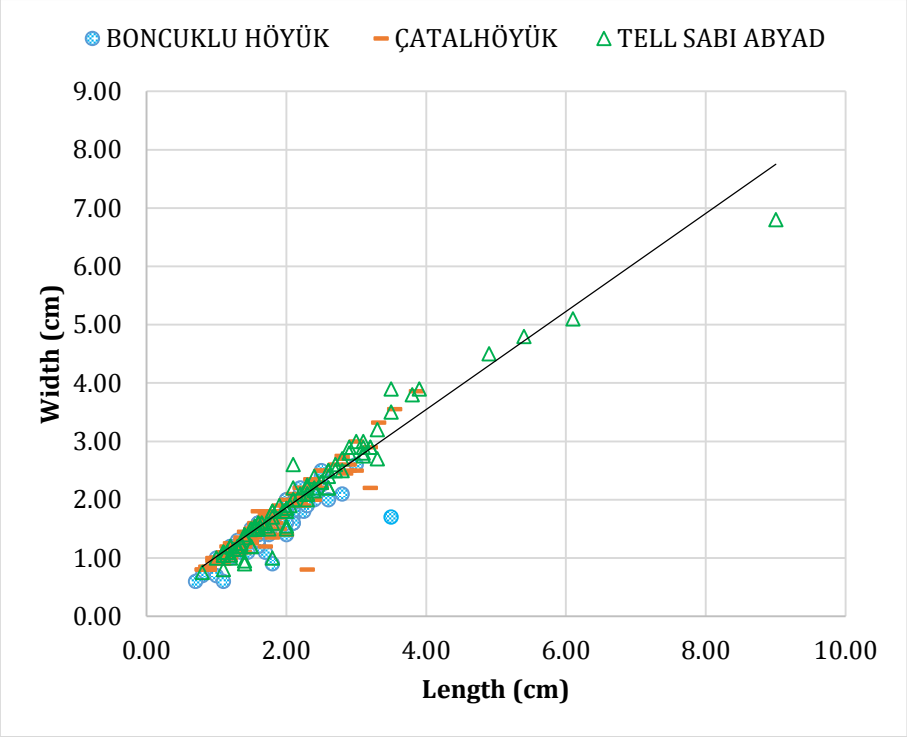


Figure A.I-1: Object fragmentation at the three case-study sites; degree of fragmentation according to three-dimensional shape (the three most common shapes).



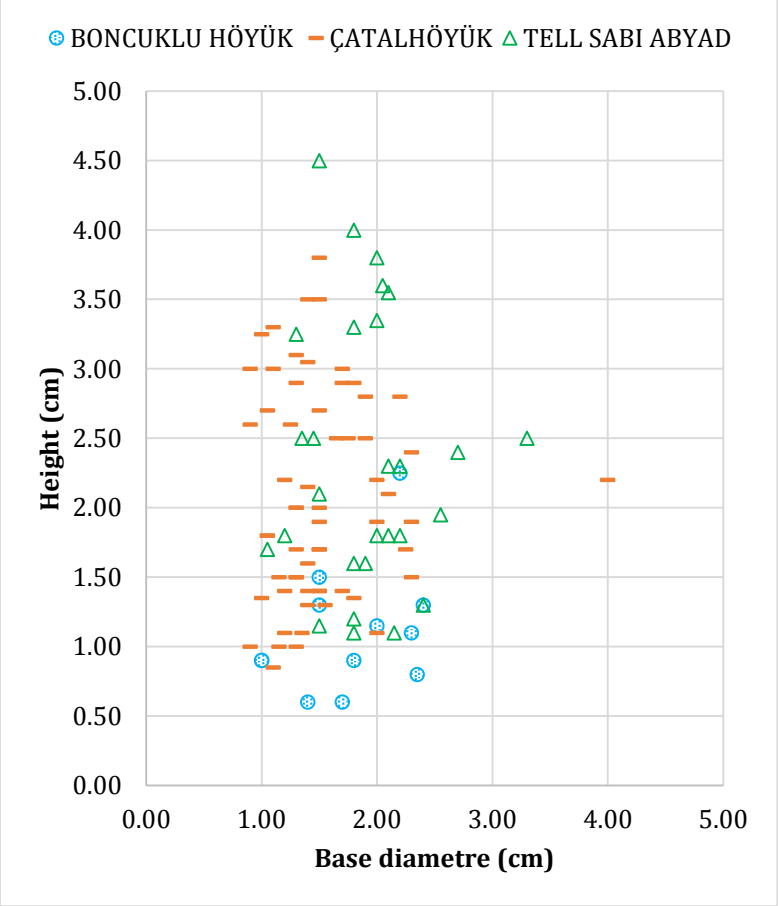


Figure A.I-2: Comparison of the range of sizes and the degree of shape degree of standardization of spheres and type 1 cones across the three case-study sites. **(Top)** spheres, **(bottom)** type 1 cones.

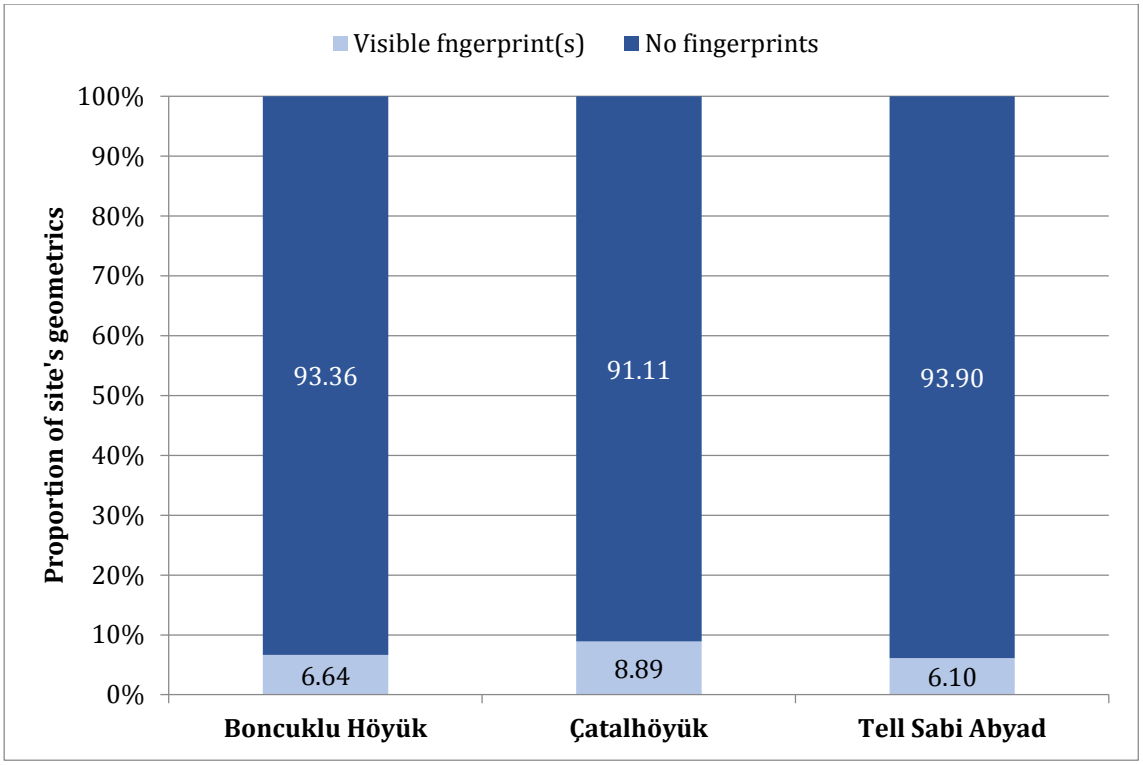


Figure A.I-3: Comparison of the proportion of clay objects displaying visible (with hand lens) fingerprints and those with none.

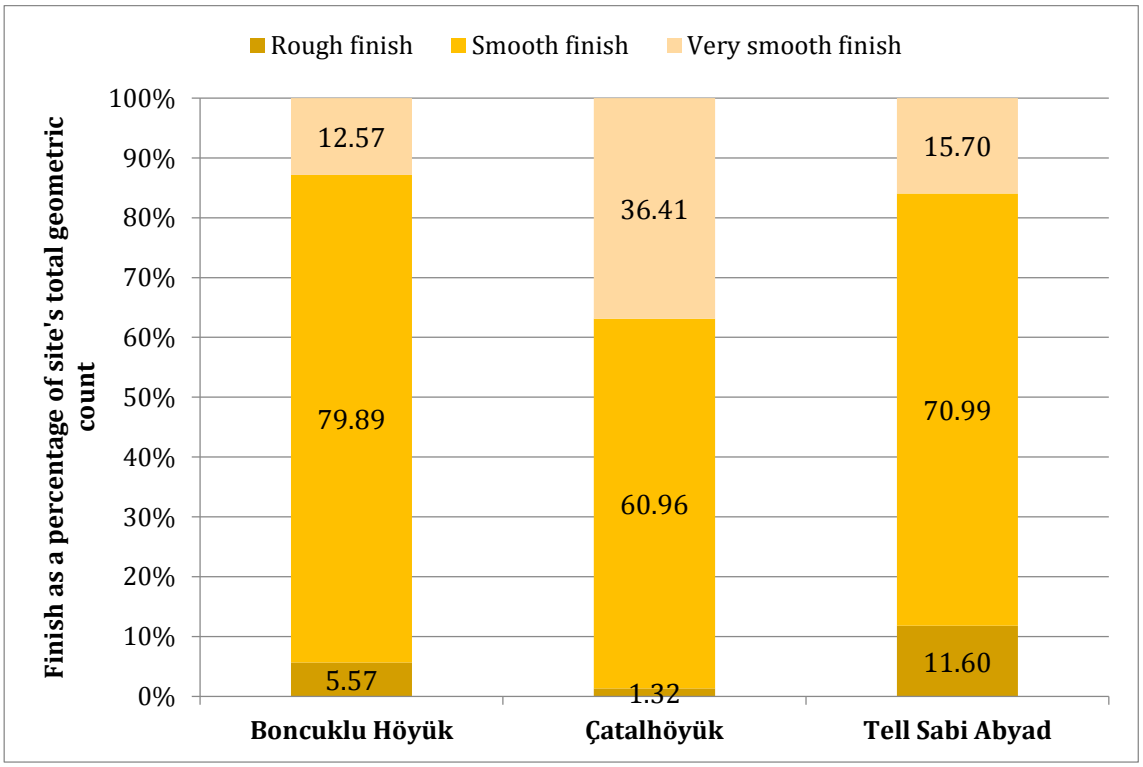


Figure A.I-4: Comparison of the proportion of clay objects at each case-study site matching each pre-set outer surface finish description.

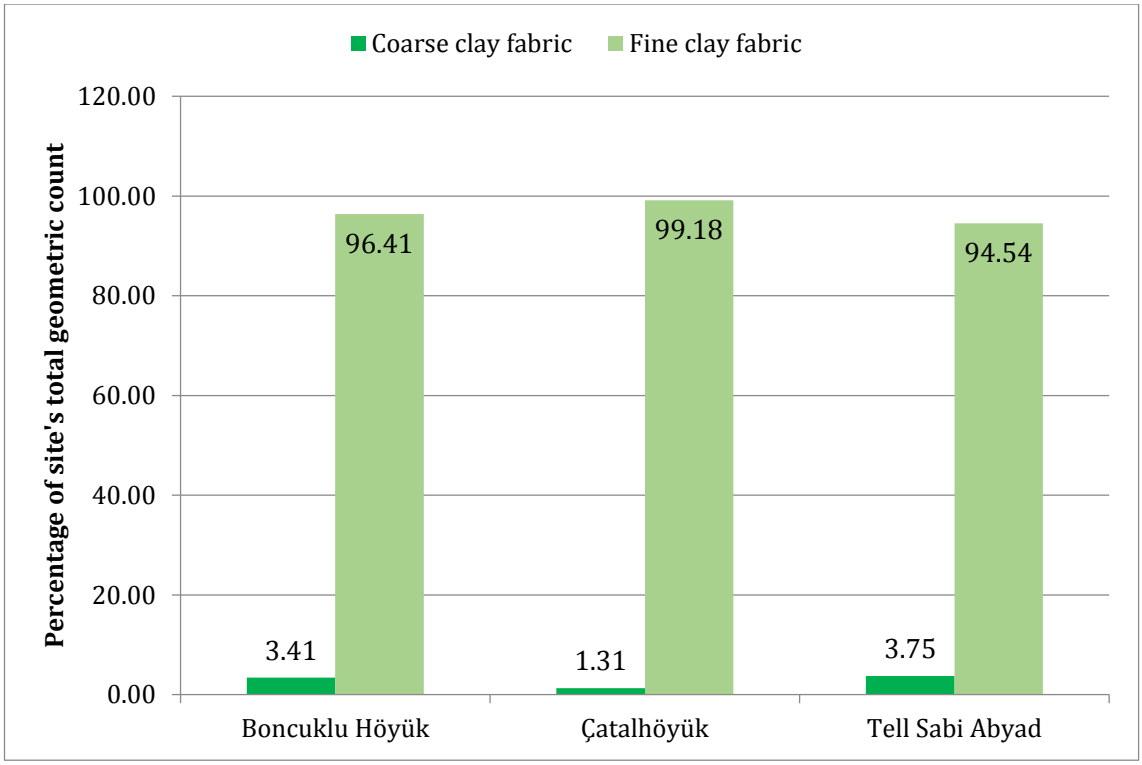


Figure A.I-5: Comparison of the proportion of clay objects of each basic clay fabric type; coarse or fine.

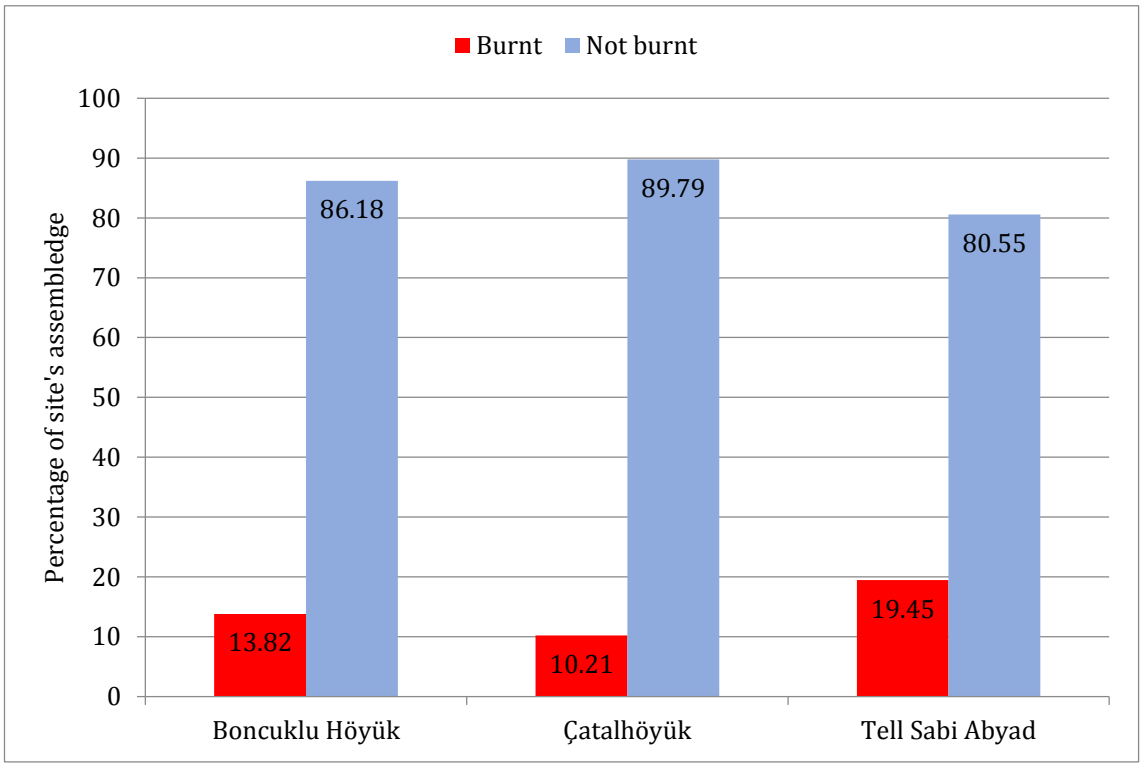


Figure A.I-6: Proportion of each case-study sites assemblage burnt.

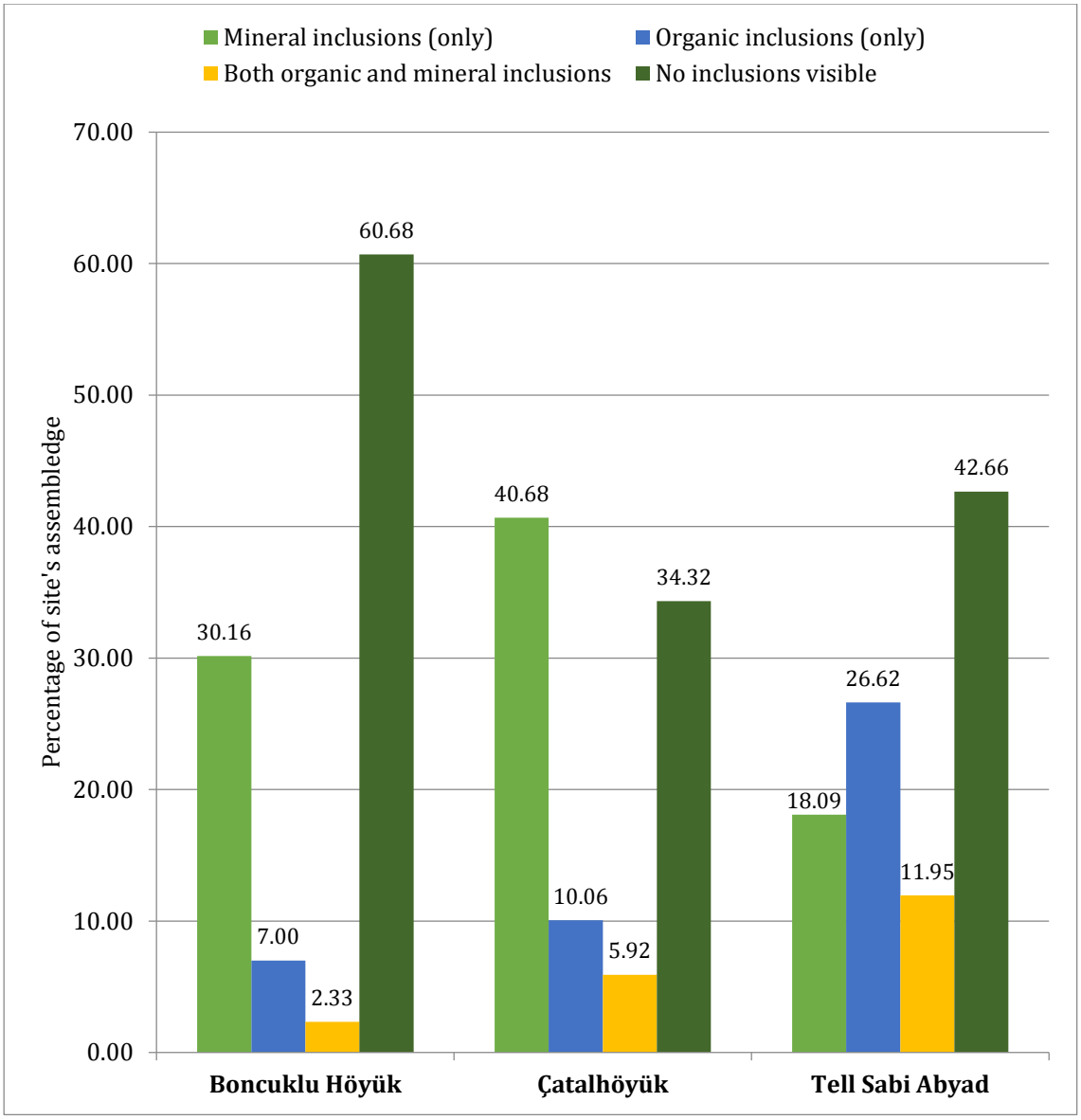


Figure A.I-7: Comparison of the presence and type of inclusions seen (as a proportion of each sites total recorded clay object count) at each case-study site.

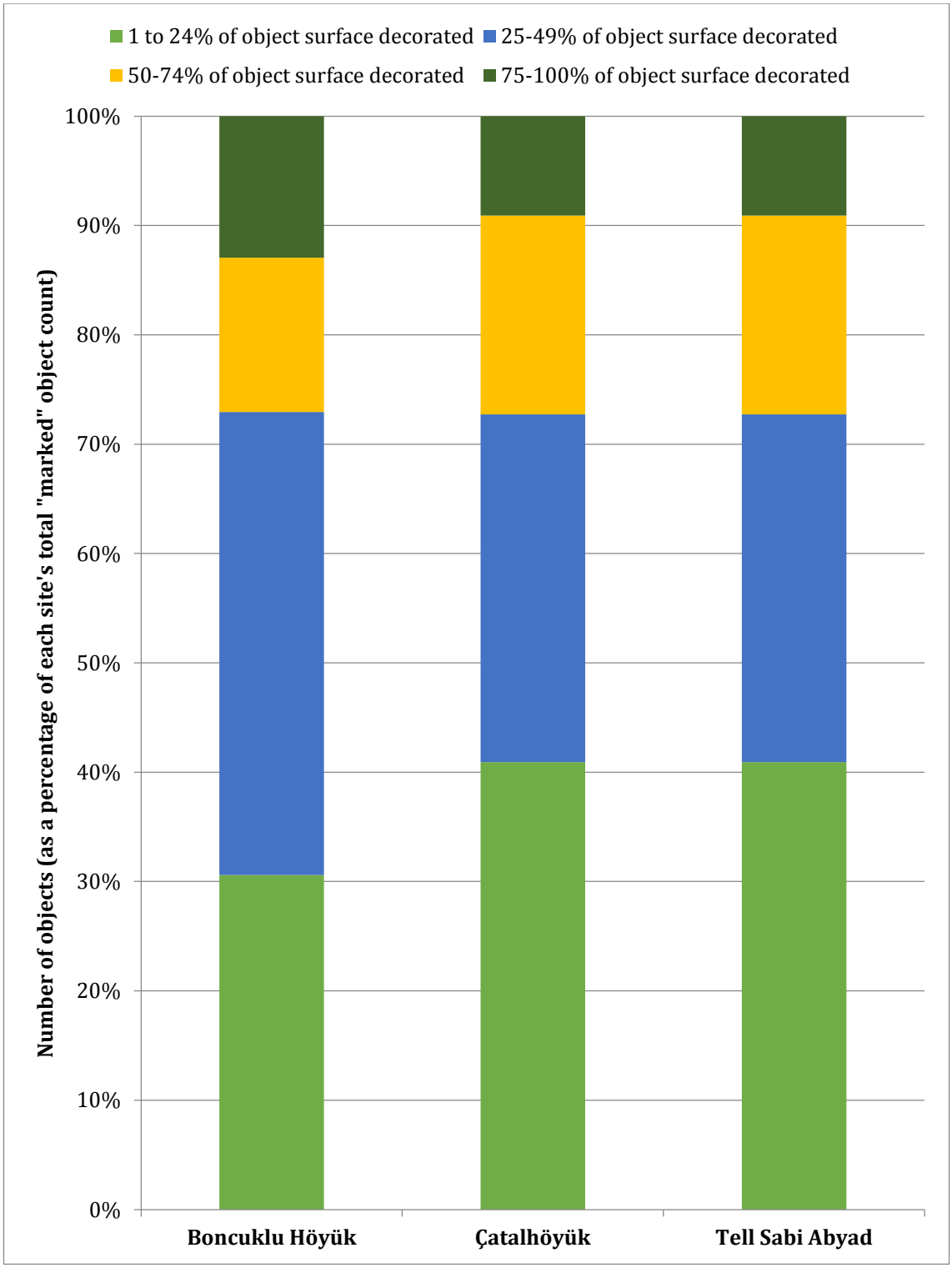


Figure A.I-8: Comparison of the degree of object coverage of intentional, decorative markings (as a proportion of each sites total recorded clay object count) at each case-study site.

TABLES

SITE	LENGTH (CM)			WIDTH(CM)			HEIGHT/THICKNESS (CM)		
	MIN.	MAX.	AVE.	MIN.	MAX.	AVE.	MIN.	MAX.	AVE.
Boncuklu Höyük	0.70	10	**2.04**	0.45	5.2	**1.61**	0.30	9.5	**1.10**
Çatalhöyük	1.20	6.85	**2.06**	1.20	5.3	**1.70**	0.20	6.1	**1.22**
Tell Sabi Abyad	0.80	5.80	**2.49**	0.75	5.70	**2.12**	0.35	4.50	**1.62**

Table A.I-1: Comparison of minimum, maximum and average clay object dimensions (in centimetres) as measured in three-dimensions at Boncuklu Höyük, Çatalhöyük and Tell Sabi Abyad.

THREE-DIMENSIONAL SHAPE-BASIC	BONCUKLU HÖYÜK		ÇATALHÖYÜK		TELL SABI ABYAD	
	COUNT	PERCENTAGE	COUNT	PERCENTAGE	COUNT	PERCENTAGE
Sphere (inc. Semi/flattened)	219	39.18	238	35.16	150	51.19
Ovoid (inc. semi-flattened)	125	22.36	52	7.68	38	12.97
Discs	174	31.13	236	34.86	81	27.65
Cube & Cuboid	7	1.25	8	1.18	2	0.68
Cones	28	5.01	97	14.33	61	20.82
Cylinder	45	8.05	18	2.66	12	4.10
Other/misc./unknown	74	13.24	46	6.79	48	16.38
TOTAL	**672**	**120.21**	**695**	**102.66**	**392**	**133.79**

THREE-DIMENSIONAL SHAPE-DETAILED	BONCUKLU HÖYÜK		ÇATALHÖYÜK		TELL SABI ABYAD	
	COUNT	PERCENTAGE	COUNT	PERCENTAGE	COUNT	PERCENTAGE
Sphere	91	16.28	168	24.82	97	24.68
F. /S. Sphere	128	22.90	70	10.34	53	13.49
Ovoid	48	8.59	20	2.95	25	6.36
F./S. Ovoid	77	13.77	32	4.73	13	3.31
Disc 1	77	13.77	57	8.42	33	8.40
Disc 2	95	16.99	163	24.08	43	10.94
Disc 3	2	0.36	16	2.36	5	1.27
Cube	0	0.00	1	0.15	2	0.51
Cuboid/f. Cube	7	1.25	7	1.03	1	0.25
Cone 1	12	2.15	62	9.16	29	7.38
Cone 2	8	1.43	10	1.48	7	1.78
Cone 3	7	1.25	5	0.74	2	0.51
Cone 4	0	0.00	4	0.59	18	4.58
Cone 5	1	0.18	16	2.36	5	1.27
Cylinder	45	8.05	18	2.66	12	3.05
Other/misc./unknown	74	13.24	46	6.79	48	12.21
TOTAL	**672**	**120.21**	**695**	**102.66**	**393**	**100.00**

Table A.I-2: Comparison of the range and proportion of three-dimensional shapes represented at the three case-study sites: **Top:** basic shape. **Bottom:** detailed shape (total count and as a percentage of each sites total number of recorded clay objects).

	BONCUKLU HÖYÜK		ÇATALHÖYÜK	
MOTIF	**NUMBER OF OBJECTS**	**% OF SITES MARKED OBJECTS**	**NUMBER OF OBJECTS**	**% OF SITES MARKED OBJECTS**
TYPE 1	44	51.16	18	40.91
TYPE 2	22	25.58	9	20.45
TYPE 3	5	5.81	2	4.55
TYPE 4	1	1.16	0	0.00
TYPE 5	0	0.00	0	0.00
TYPE 6	0	0.00	1	2.27
TYPE	7	8.14	6	13.64
TYPE 8	2	2.33	1	2.27
TYPE 9	1	1.16	0	0.00
TYPE 10	2	2.33	3	6.82
TYPE 11	0	0.00	0	0.00
TYPE 12	25	29.07	7	15.91
TYPE 13	9	10.47	1	2.27

Table A.I-3: Design dominance, the number of objects each decorative motif is present on according to site: Boncuklu Höyük and Çatalhöyük.

ELECTRONIC FILES

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